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The One-Way Dollar

THIS wriggling rather reluctantly into the British lion's skin, even before the lion has been quite willing to admit it is dead, is going to cost a great deal of money. So much money, in fact, that many of the old, emotional and popular illusions about dollars, international trade, tariffs and such, must undergo some drastic alterations.

Take this matter of foreign trade. For twenty years before the war, it was considered clever indeed to ship out more real goods than were imported. Classical economic doctrine eulogizes a favorable balance of trade. If foreigners didn't have sufficient dollars to pay for the difference, American banks loaned them the money or the government subsidized exports by heavy purchases of gold. The money couldn't be paid back. That could be done only by selling goods in this country.

Maybe the country has an insatiable national appetite for phoney revelation. And one of the phoniest is the idea that there is something economically very clever in encouraging exports and discouraging imports. It would seem that the really clever thing would be to invite the world to ship goods and services to the United States without being paid for them. If enough suckers could be found to do this, everyone in the United States could retire to leisure and live quite nicely as the foreign taxpayer knocked himself out.

Here in this year of 1947 the worn out formula is monotonously repeating, but on a grander scale. For the year, about \$5 to \$8 billion more of goods will be exported than imported. This gap will be closed by dubious loans, by gifts, by gold imports, by drafts upon the Export-Import bank and on the two Bretton Woods institutions, the International Bank and the Monetary Fund. This very heavy unbalance in favor of exports means severe strains (\$200 or so, for each family) on American standards of living. It must go on for years, and rightly so, if the Truman Doctrine is to be fully implemented, if obvious moral obligations are to be met, and if European recovery is to be saved from a series of economic and political crises of incalculable proportions.

But why must the dollar-flow (i.e. American real goods) always be one way? Why must American tariff policy always discourage repayment? To be sure, right now in the magnificent assembly hall of the Palais des Nations in Geneva, Americans are sparking sentiment for world-wide tariff reductions. But at home, there is a continual and growing clamor in opposition, so much so that the prospect of really prying open world trade barriers seems bleak and unpromising.

There is no downing the conventional superstition and prejudice against lower tariffs. But it does seem strange indeed in a country with credit balances abroad for billions of dollars of goods and services. The old protective emotion surges strongly in the industrialist, the farmer and the worker. The abstractions of free trade are complex, of interest only to economic realists.

If and when the much advertised recession rears its ugly head, the silver-tongued orators again will spearhead the clamorous shouts of minorities, lobbyists, special interest groups, cattle senators and farm spokesmen. To them the shock would be too great in suggesting that continued robbing of the taxpayer Peter to pay the exporter Paul is nothing but a dreary dead end street. For them, there never is understanding that it is the goods which go out, not the goods that come in, that reduce standards of living.

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**INLAND
STEEL**

May 27, 1947

A major steel producer that has been operating its own oxygen plant mainly for maintenance and similar requirements is planning another of greater capacity. Some of the output of the present plant has been used experimentally in steel-making but the new one is expected to take care of immediate oxygen needs for this purpose.

Materials handling equipment for metal fabricating and processing plants has jammed the order books of manufacturers. Ordinary sections of roller conveyors cannot be delivered under 6 months and equipment requiring any amount of engineering is being quoted for delivery in a year or more.

Allegheny Ludlum is installing 20 tanks at its Brackenridge, Pa., plant to hold 360,000 gal of propane to insure against any possible curtailment of operations next winter due to a natural gas shortage. This amount of propane, shipped during the summer in tank cars, will be equivalent to about 32,725,000 cu ft of natural gas.

Extensive research carried on during the past year at Ford Motor Co. indicates that cadmium plating has advantages over both zinc and tin as a rust preventative for hardened and tempered high carbon coiled springs.

The shipbreakers have found silvery pig iron containing 9 pct silicon as part of the "Normandie" ballast. One carload has already been sold but operations have not reached the point where an estimate of total tonnage can be made.

In many steel companies merit raises for white collar employees have been few and far between in the past several years. Privately, supervisory and other salaried workers are thanking the steelworkers union for the raise in pay last year and the one just granted which in most cases amounts to about 12 pct and reaches levels as high as \$800 a month.

Although copper supply continues critically short, indications are multiplying that there may be a decline in the world price during the next few months based on curtailed demand here and abroad coupled with increased production from Africa. But the domestic price, tied to the world price, may reach 24¢ before a decline to lower levels.

Oldsmobile is said to have developed a new oil for its Hydramatic Drive that remains fluid at temperatures as low as 40° F below zero. Use of the new oil plus mechanical changes incorporated in postwar Hydramatics is said to have practically eliminated cold starting difficulties.

Steel mill requirements for heavy equipment such as ladles, converters, slag cars and metal runners, both in this country and abroad, give these manufacturers backlog that approaches two full years of operations.

Vertical furnaces are gaining in popularity, the newest being a strip annealing unit which uses associated ammonia atmosphere. On nonferrous strip production it is cutting costs and increasing production. At the same time product quality is said to be higher.

Steel demand is still heavy and deliveries belated but a little hesitation in steel buying is appearing around the edges. Miscellaneous requirements for narrow strip and some of the steel used by makers of bedsprings, radios and some auto parts are showing signs of leveling off—temporarily at least.

Some of these steel customers are saying they won't take any steel until September. The total tonnage involved in this easing is insignificant but it gives some people the jitters.

Contrary to recent reports, General Motors is not assuming responsibility for operation of the Opel automobile plant in Russelsheim, near Frankfurt, Germany. This plant is still under U. S. Military Government custody and management. However, the plant will sell service parts to GM subsidiaries in other European countries.

So many brokers and steel users are now trying to peddle excess inventories that the so called gray market can be definitely considered on its way out.

One answer to the private pilot's problem may be a 72-lb "car" that carries three people and can be folded and put in the trunk of an ordinary sedan. It is built of aluminum tubing and powered by a one-cylinder 2 and 1/2-hp. motor.

Spectrographic Control

THE Tropenas converter process has become widely used in foundries and steelworks as a result of wartime demands for rapid and increased production of steel, and the quantity of steel produced by this process in some countries is now nearly equal to the tonnage produced in the electric arc furnace. The converter process (acid) is specially suited to the production of steel castings because of its flexibility and simplicity. The quality of the steel produced is generally regarded as being more variable and questionable than that made by the other processes in wide use, but the fundamental advantages of the process are such that could a closer degree of control be maintained over the process, it could compete in cost and output with other methods.

Essentially, to obtain the best possible castings, the melting shop must supply the foundry with clean steel, properly deoxidized, accurate to chemical specification, and at a temperature exactly suited to the molds to be teemed. The extent to which these requirements can be complied with, depends entirely on the judgment of the melter, who is unable to see the condition of the melt during the blow. He has only the converter flame to guide him in his judgment of temperature and has no accurate indication of the condition and composition of the bath until it is too late to rectify errors. Present practice requires cupola metal of about 3.2 pct C and 1.5 pct Si content, which is blown down until the elimination of carbon has become so slow that the bath starts to oxidize; the heat is then killed with manganese and silicon and subsequently recarburized in the ladle with ferromanganese, pig iron or cupola metal. The temperature is judged—by observation of flame color and shape—in the early stages of the blow immediately after the slag formation and adjustment made by ferrosilicon addition. Results obtained from a number of blows indicate that the temperature varies in successive blows by as much as 150°C (270°F), and the carbon content of the bath varies from 0.05 to 0.18 pct with difficult heats such as when cold cupola metal is blown in a badly-shaped vessel.

It is generally accepted that the initial reaction taking place in the vessel is the oxidization of iron to iron oxide. This forms a slag which is reduced in turn by manganese, silicon and carbon, forming silicates and carbon monoxide. The carbon monoxide burns at the nose of the vessel in a flame that undergoes distinct changes as the blow proceeds. The first flame appears soon after the start of the blow and is best described as a red-yellow glow at the nose of the vessel. It is associated with dense brown smoke and streaked with sparks. This flame changes to a mounting yellow flame that becomes extremely bright at the boil, at which time the air pressure is reduced to prevent the bath from slopping. After the boil has sub-

By S. T. JAZWINSKI
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• • •

sided the flame becomes shorter and more sharply defined, then grows brighter and longer till it takes on the flaring character of the carbon flame.

Oxidation of iron and the appearance of brown fume around the flame as it shortens indicate that the carbon content of the bath is near to 0.1 pct, and the vessel is turned down.

The first flame is taken to be the start of the carbon monoxide and carbon dioxide reactions (the oxidation of iron and manganese and most of the silicon having already taken place). Boiling is regarded as the violent evolution of carbon monoxide which burns to carbon dioxide at the nose, and this reaction continues steadily until the end of the blow, when it becomes more and more sluggish and the flame drops.

The variable nature of converter steel is undoubtedly due only to under and overblown heats, and most attempts to control the process have been directed towards a more accurate and reliable determination of the end of the blow, since even a short overblow results in a bath dangerously over-oxidized or burned. It is a simple matter to recognize the drop of the carbon flame and a skilled blower can maintain a limit of about 0.06 to 0.12 pct in the blown metal. Such limits are not sufficiently close for present day specifications and the use of a light—a sensitive cell and filters which indicate the drop of the flame more accurately than the blower and record a variation of 0.005 pct C in the blown metal—is spreading.¹

In order to illuminate converter metallurgy and place it on a comparative level with other metallurgical processes, it is clear that only a knowledge of the character of the converter flame can give a satisfactory answer. By the same token, the primary reactions which are taking place, could more clearly explain the anomalies of the process. Considering these two aspects, the following working theory is submitted: "The main product of converter reactions is carbonyl of iron, which is formed from iron oxide and iron carbide. Due to the instability of this product, it will decompose into atomic iron and carbon monoxide."

Following this line of thought, various experiments were performed to confirm this theory and to prove how knowledge of converter metallurgy is useful in practice. First, it was necessary to consider the presence of iron carbide— $3\text{Fe} + \text{C} = \text{Fe}_3\text{C}$. This reaction proceeds in the direction of the maximum diminution of free energy of the system. The free energy becomes increasingly negative in the direction of higher temperatures. From free energy of the formation Fe_3C , it can be said that this compound is stable above 750°C (1382°F).

The spectrum of the flame has been previously

of the Converter Blow

The attempt is made to correlate the end point with the disappearance of certain spectrum bands, in side-blown converter operation, and at the same time an effort is made to predict the composition of the bath and the temperature during a blow by the atomic spectrum. This article, which deals with the Tropenas converter, touches upon several new concepts of converter metallurgy developed during wartime research in England at which time the author was a member of the converter committee of the Iron & Steel Institute, London.

described by the author², but no actual wavelengths were given and no attempt was made to identify the elements present. Nevertheless, the disappearance of certain lines in the flame spectrum were correlated with the end of the blow.

The object of this paper is to enlarge the existing view and to correlate it with the process itself. Obviously, it seems necessary to consider; (1) in what condition the elements exist, and (2) how they should

¹ Jones & Laughlin Patent No. 540243.

² S. T. Jazwinski, "The Control of Tropenas Converter Blowing by a Direct Vision Spectroscope," Iron & Steel Institute, Advance Copy, June 1945.

be assessed in order to provide the necessary information. The strength of the emission spectrum in different stages of the converter process should be a guide to the process itself. It is obvious that a sufficient concentration of atoms of any element must be present in order to produce a strong emission spectrum.

It must also not be overlooked that the source (flame temperature) should possess sufficient energy to excite the atoms to the required extent, if it is to be assumed that excitation in the flame is due chiefly to thermal causes, rather than chemiluminescence.

It is agreed that neither carbon monoxide nor carbon dioxide spectrum could be observed, because in the flame under consideration there is not sufficient energy to excite these molecules. Furthermore, both carbon dioxide and monoxide, as molecules, could give a band spectrum only. The luminosity of the flame is due to carbon monoxide, which, according to Kondratiew, indicates that the emission is of chemiluminescent origin.

Metallurgy of the Process

It is difficult to determine to what extent iron carbonyl is formed during the converter blow. Generally speaking, analyses of gas samples taken from the vessel during the blow are not reliable, and there is no means of distinguishing between iron lost as a result of the dissociation of carbonyl and the mechanical loss of iron in ejections. The high loss of iron in the quietest converter blows suggests that the carbonyl reaction may be the major reaction taking place in the vessel. This being the case, the whole question of

blowing losses can be regarded from a completely different viewpoint. It has been usual to divide the losses in the converter blow into chemical loss, carbon, silicon, manganese and mechanical loss, or losses due to ejections. It now appears that the iron loss, which averages 4 pct in the modern converter, is to some extent inevitable chemical loss and is not controllable by design of vessel. Since it is not possible to assess the exact part which carbonyl plays in the metallurgy of the process, it is interesting to consider the extreme case and assume that all the carbon in the bath first reacts with oxygen in the presence of iron to form iron carbonyl, and that this product then dissociates to carbon monoxide and nascent iron, each of which then oxidizes further.

The reactions that take place in the converter may be considered in three groups; (1) the reactions in the bath between slag and impurities, (2) the reactions above the bath in the slag, and (3) the reactions over the slag and in the flame. It remains convenient to consider the process in three stages.

Stage 1—This might well be referred to as the stage in which the first slag is formed. The first slag is oxidizing and predominantly basic. It is common practice to add silica sand to the vessel before the blow to reduce the erosive action of this first slag on the lining of the vessel.

Admission of air through the tuyeres oxidizes iron according to the reaction $(1) 2\text{Fe} + \text{O}_2 = 2\text{FeO}$, and the iron oxide formed reacts with manganese and silicon in that order; $(2) \text{FeO} + \text{Mn} = \text{MnO} + \text{Fe}$, and $(3) 2\text{FeO} + \text{Si} = 2\text{Fe} + \text{SiO}_2$. Reaction (2) is almost at equilibrium by the start of the boil and (3) reaches equilibrium by the end of the boil.

Stage 2—As soon as the first flame appears, carbon monoxide is being oxidized to carbon dioxide. This may begin at the start of the blow when the temperature of the metal charge is high—reaction (1)—or it may be delayed until the bath has attained a sufficiently high temperature.

The carbon oxidation of the slag is represented by reaction (4); $5\text{FeO} + 5\text{Fe}_3\text{C} = \text{Fe}(\text{CO})_5 + 19\text{Fe}$. Reaction (3) continues to equilibrium through this stage. The concentration of FeO in the bath and slag is maintained by the constant oxidation of iron to the end of the blow. Manganese silicate is formed

TABLE I
Relation Between Atomic Spectrum of Iron and Existence of Carbon, Iron and Oxygen

No.	Experiment	Main Flame Constituents		Spectrum Observed	Element Identified	Possible Reactions
		CO	O ₂			
1	Spray of FeCl ₃ (HCl + Zn or Fe)	CO	O ₂	lines	Fe	Dissociation of FeCl ₃ → Fe + 3Cl
2	Low carbon iron rod	—	O ₂	no spectrum	—	FeO and Fe ₂ O ₃
3	Low carbon iron rod	CO	—	lines	Fe	Fe x (CO) y → x Fe + y CO → FeO + CO ₂
4	High carbon iron rod	CO	—	lines	Fe	Fe x (CO) y → x Fe + y CO → FeO + CO ₂
5	High carbon iron rod	—	O ₂	lines	Fe	Fe x (CO) y → x Fe + y CO → FeO + CO ₂
6	Molten cast iron fed with hematite ore	—	—	lines	Fe	3mFe ₂ C + mFe ₂ O ₃ → (11m - x) Fe + Fe (CO) _{3m} → x Fe + (11m - x) Fe + 3mCO → FeO + CO ₂
7	Molten cast iron without adding hematite ore	—	—	no spectrum	—	Fe ₂ C
8	Converter flame	—	—	lines	Fe	yFe ₂ C + yFeO → Fe x (CO) y + (4y - x) Fe → 4yFe + y CO → FeO + CO ₂

With Fe present in an easily excitable form, line spectrum was observed; with Fe, C and O₂ present, line spectrum was observed; with Fe and O₂ only present, no line spectrum was detected; and with Fe and C only present, no line spectrum was detected.

in the slag (MnO + SiO₂ = MnSiO₃), which becomes very fluid. Above the bath, iron carbonyl dissociates into iron and carbon monoxide (which burns to carbon dioxide at the nose).

Stage 3—This stage is the carbon flame period, and is characteristically steady, without much ejection of slag. The slag is close to equilibrium at or around the start of the carbon flame, and since the concentration of FeO in the slag and bath is not high, no boiling takes place. Silica is eroded from the lining continuously if the temperature is high enough, and some silica is reduced (from the slag) to silicon and dissolves in the bath according to the reaction; 5 FeSiO₂ + C = 2Fe (CO)₅ + 5Si + 3Fe. The dissociation of carbonyl produces atomic iron, which persists in the flame at so high a temperature that the iron spectrum becomes clear, and carbon monoxide burns quietly to carbon dioxide at the nose.

End of Blow

At the end of the blow, the flame, containing an excess of oxygen, shortens. Essentially the vessel must be turned down before the bath becomes over-oxidized. The equilibrium between FeO and carbon at this point is hyperbolic, see fig. 1, and the removal of carbon becomes more and more sluggish until at 0.04 pct or thereabouts, depending on the temperature of the heat, the FeO-carbon reaction reaches equilibrium and the lining is attacked.

Down to 0.1 pct C, the change in FeO concentration required to produce a given change in the carbon content is almost linear, and if the blow is finished before this point is reached, the heat will be satisfactory. It is not always possible to stop the blow at this point by use of the naked eye, however, and a more sensitive instrument is necessary to determine the exact end of the blow, which may in some cases precede the drop of the flame. The possibility of finishing the converter blow with any desired carbon content up to 1.5 pct, by observation of electro-magnetic spectrum, is a most attractive one, and involves shorter blowing times and far lower losses.

Until recently it has been held that most of the

increase in temperature in the converter blow is obtained from the oxidation of silicon to silica. It is now generally agreed that the greater part of the temperature rise results from the oxidation of carbon to carbon dioxide.

Laboratory Experiments

A series of experiments were made in the laboratory using oxy-coal gas flame as a source of heat energy in order to excite the iron atom. Examination was limited to that part of the visible light spectrum in the range of $\lambda = 5090$ to $\lambda = 7000$ Å°. In these investigations a calibrated spectroscope, made by A. Hilger was used throughout.

The setting of the instrument was generally accomplished by bringing the medium doublet 5890Å°/5896Å° into the cross-hair, the drum reading 5893Å°. The resolving power of the spectroscope was such that it permitted one to occasionally see two separate lines. A mercury vapor lamp provided an easy means of checking the graduation on the drum. It was found that on setting accurately one of the red lines, there was a discrepancy in the green part of the spectrum, amounting to 3 to 4Å°, and vice versa.

The first flame spectrum was obtained from ferric chloride solution in hydrochloric acid contained in an evaporating dish in front of the instrument and just below its optical axis. Above the dish, a horizontal oxy-coal gas flame nearly touched the surface of the solution. On adding some metallic zinc or iron, an evolution of hydrogen was promoted, with it a very fine spray of FeCl₃ solution. When passing through the flame, this spray produced some spectrum lines, a few of which were measured and afterwards identified as belonging to iron. Iron in this experiment was produced in the nascent state by hydrolysis of FeCl₃. By changing the amount of oxygen and coal gas the effect was the same.

Direct burning in oxy-coal gas flame of pure iron rods (about 0.04 pct C) produced occasional spectrum lines flashing in the instrument for short periods of time—a few seconds or sometimes a little longer. Some

of them were measured and identified as iron lines. When the coal-gas supply is reduced, iron continues burning in a stream of oxygen. With very little or no coal gas, however, no spectrum lines could be detected in many similar experiments. In readmitting the coal gas, flashes of spectrum lines would appear in the instrument.

Similar experiments carried out with about 1 pct C steel rod gave the following results. The rod burning in an oxy-coal gas flame gave occasional flashes of spectrum lines, exactly as in the previous experiments. On cutting off the coal gas supply, the spectrum lines would occasionally flash in the instrument, only a little weaker than before.

In another experiment, a few hundred grams of hematite cast iron were placed into a graphite crucible and melted in a strong flame. The spectroscope was situated a few feet apart from and above the crucible and pointed at the surface of the molten metal. Only continuous spectrum could be seen, the same as formed the background in all the other experiments. On throwing some powdered hematite ore on the free metallic surface, a strong boil started, accompanied by intense spectrum lines in the spectroscope. These lines persisted as long as the strong boil lasted and reappeared on fresh additions of powdered hematite ore. Some of the lines were measured and were identified as belonging to iron. The observations are summarized in table I.

Having established the possibility of observation of the atomic spectrum of iron in various conditions in the laboratory, the next step was to observe the flame spectrum of the converter. Results of the iron atom spectrum laboratory experiments are given in fig. 2.

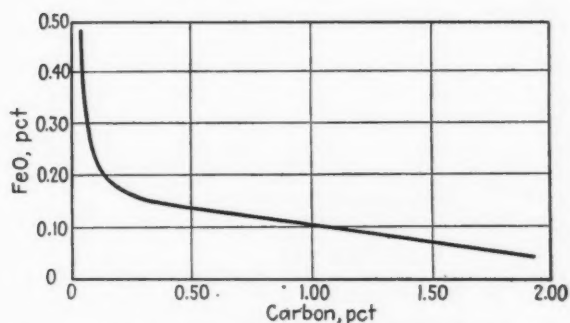


FIG. 1—Relation between carbon content and FeO content in steel bath.

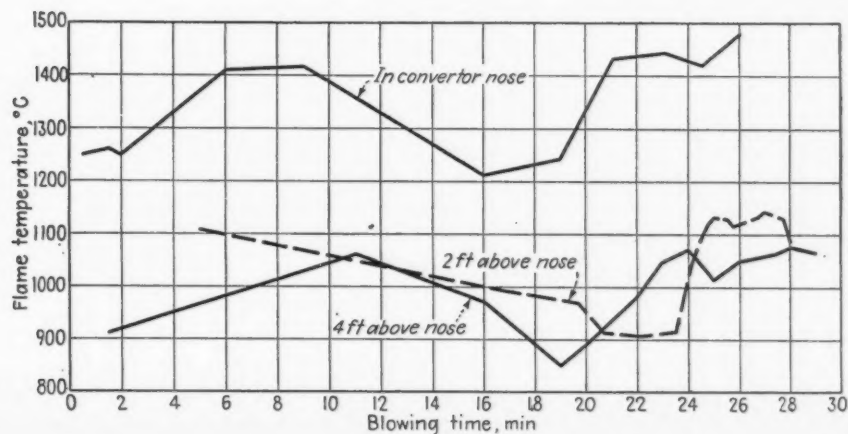


FIG. 2—Iron atom spectrum in laboratory experiments.

FIG. 3—Relation between blowing time to flame temperature at different heights over converter mouth.

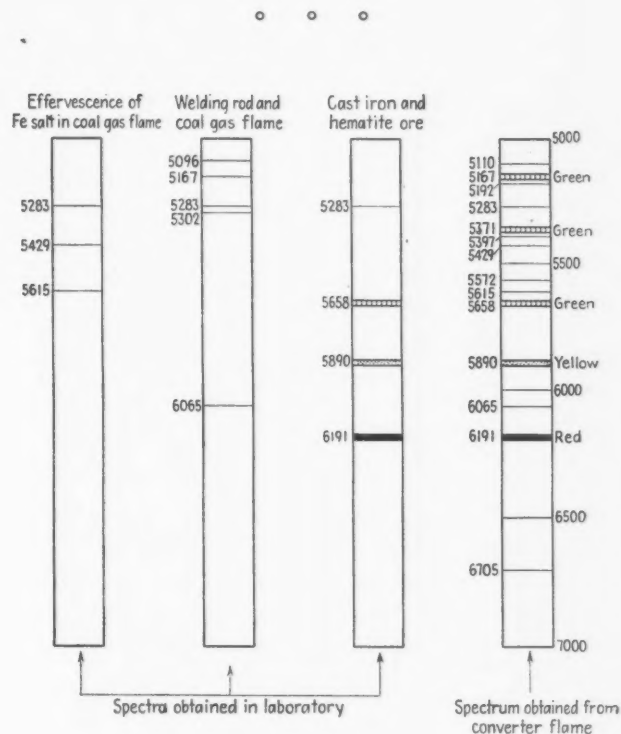
Three experiments were made, using a platinum: platinum-rhodium thermocouple to measure the temperature of the flame at different heights above the nose.

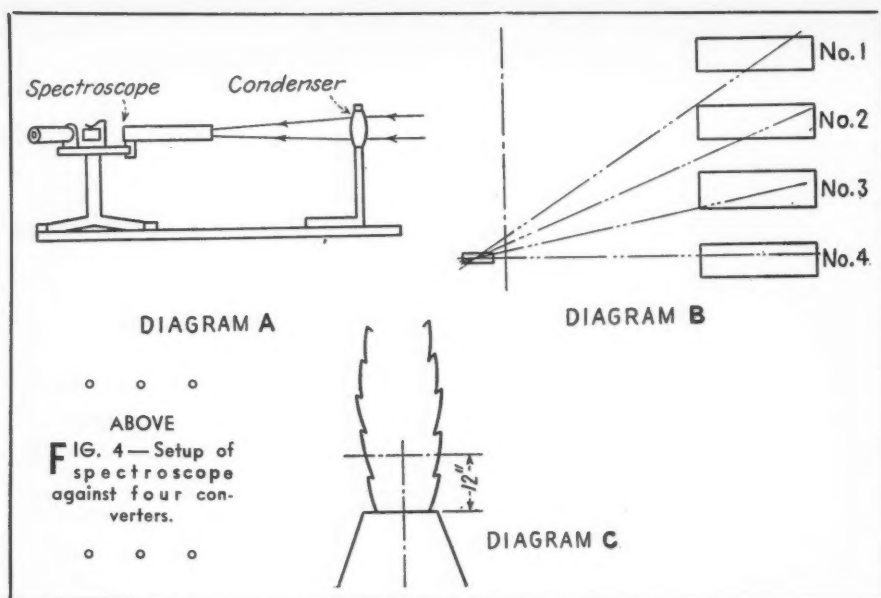
The thermocouple was protected by a spiral steel spring and a silica sheath from mechanical damage by ejections. The thermocouple was suspended over the vessel in a sling dropped from the hood, and swung into the flame at intervals that were progressively shorter towards the end of the blow. The results of the three tests are plotted in fig. 3.

Spectroscopic Flame Examination

A further series of experiments were carried out using a calibrated wavelength spectrometer, since in earlier experiments made by the author with the direct-vision spectroscope it was not possible to record the wavelengths of lines appearing in the flame spectrum.

Fig. 4A shows the setup, and 4B the position, from





which the observations were made. An image of the flame was produced on the slit of the collimator by adjusting the position of the condenser, the slit being opened out to its full width.

Fig. 4C shows the sighting point, which lies on the flame axis approximately 12 in. above the nose and coincides with the midpoint of the slit. As the blow proceeded, the slit was closed to its minimum width. It was difficult to obtain the exact duration of all the bands in the spectrum, as the whole of the spectrum could not be observed at once, but the results summarized in fig. 5 for four blows are accurate within 5 sec. The complete spec-

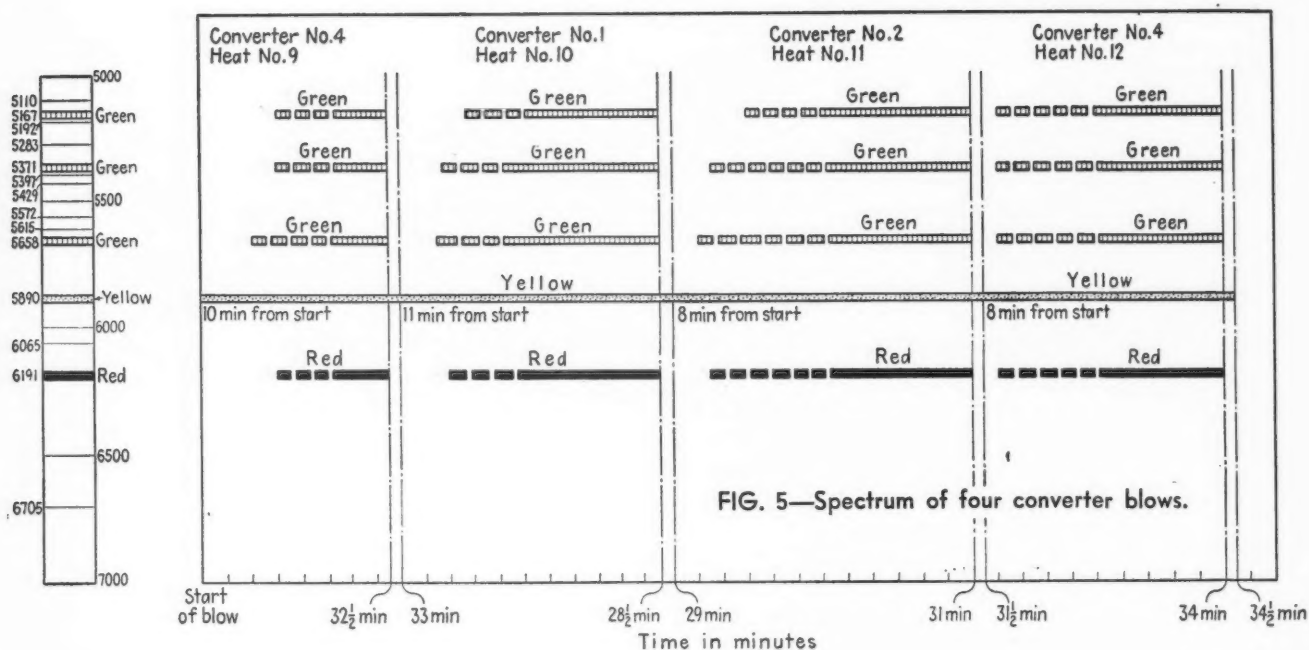


TABLE II
Analysis of Three Blows in Different Stages

Stage	Time, Min.	Metal Weight, Lb	C, Pct	Si, Pct	Mn, Pct	Carbon Weight, Lb	Silicon Weight, Lb	Manganese Weight, Lb	Fe Loss as Carbonyl	SiO ₂ (slag), Pct	FeO (slag), Pct	MnO (slag), Pct	Al ₂ O ₃	Total Weight, Slag, Lb	SiO ₂ (slag), Lb	FeO (slag), Lb	Si (slag), Lb
0	0	6272	2.9	0.78	0.3	182	48.8	18.8									
1	4.5	6108	2.5	0.27	0.1	156	16.9	6.2	24.5	37.6	46.2	8.5	1.9	192	72.5	88.8	34
2	5	5978	1.9	0.06	0.03	116	3.6	1.6	37.5	37.4	50.1	8.2	2	268	100	134	46.8
3	3	5896	1.5	0.01	0.005	90	0.6	0.3	24.4	34.9	53.5	7.6	1	315	110	168	51.5
4	15	5809	0.4	0.01	0.005	23.6	0.6	0.3	62	54.9	34	7.0		342	187	116	87
5	3.5	5787	0.07	0.01	0.005	4.06	0.6	0.3	18	55	33.2	8.3		287	157	95.5	77
0	0	5712	2.6	0.7	0.31	148	40	17.6									
1	8	5551	2.4	0.22	0.08	136	12.5	4.5	11.2	32.6	50.1	6.8	5.31	249	81	124	38
2										33.52	49.12	6	4.4				
3	11	5424	1	0.01	0.005	55	0.55	0.28	76	45.49	33.52	11.4	3.34	196	88	65.5	41.2
4	5	5331	0.28	0.01	0.005	15.2	0.54	0.27	37.2	44.93	35.28	9.13	4.6	245	110	86.5	51.5
5	2	5320	0.1	0.01	0.005	5.3	0.53	0.27	9.3	50.85	33.52	9.8	4.19	228	114.5	76	53
0	0	4638	2.6	1.12	0.3	120.5	52	14									
1																	
2	7	4558	2.5	0.48	0.18	116	22.3	8.3	3.8	37.47	47.35	7.62		96.8	35.2	46	16.5
3	11	4458	1.6	0.15	0.15	73	0.68	0.68	40	44.05	40.67	8.22	1.63	113	49.8	46	23.2
4	9	4354	0.85	0.01	0.01	38	0.45	0.45	32.5	51.11	35.10	7.92	1.7	220	112	77	52.5
5	7	4307	0.87	0.01	0.01	4.65	0.5	0.5	32	56.77	26.44	8.59	0.8	203	115	53.5	54

CONVERTER NO.1
HEAT NO.10
5-9-45

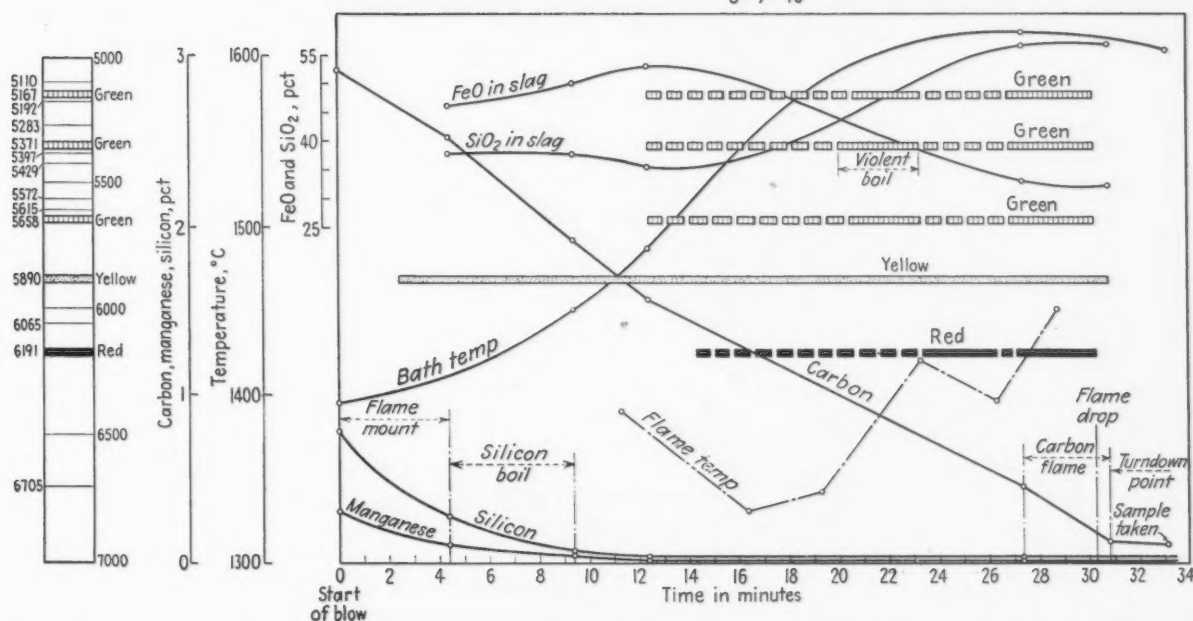


FIG. 6—Metallurgy of the converter process indicating effects of starting blow with vessel and charge at as high a temperature as possible.

trum, containing all the bands confirmed at present during the blow, is indicated on the left side of fig. 5. The most intense and persistent bands are indicated, as well as the intermittent and persistent. It was not possible to observe the atomic spectrum of iron in the first stage of the converter blow.

With a view to estimating the probable reactions taking place in the bath in the various stages of the process, three typical blows were examined from as many aspects as possible.

Samples of desulfurized cupola metal were taken and the temperature of the metal charge was measured with the quick-immersion thermocouple just before the blow started. The vessel was turned down at (a) the start of the boil, (b) the end of the boil, (c) the first appearance of the spectrum bands, (d) the time when the bands became clear and persistent, (e) the start of the carbon flame, and (f) the end of the blow as

judged by the operator. Samples of metal and slag were taken and the bath temperature was measured with the quick-immersion thermocouple. A record of flame temperature was obtained, using the optical pyrometer. The results obtained are indicated in figs. 6 and 7, with additional data listed in table II.

The first two experiments clearly show the advantage to be gained from starting the blow with vessel and charge at as high a temperature as possible. In the first experiment, the metal charged was at 1400°C (2552°F) at the start of the blow, and carbon elimination began immediately as wind was admitted to the bath. It is realized that this should have resulted in a shorter blowing time, although actually it did not. An explanation of this lies in the far greater weight of total carbon, silicon and manganese that was eliminated in the first blow owing to the larger capacity of the vessel. In the first experiment some considerable time was lost in sampling and taking temperature readings with the bath losing temperature all the time. Experience gained in this experiment prevented similar loss of time in the second and third blows and the blowing time was therefore not so greatly affected.

Flame Spectrum and Bath Composition

In table III is tabulated the composition of the bath at each change in the flame spectrum in the three experimental blows. Most interesting possibilities are illuminated here, and it would appear that this is a field that would warrant further research.

The close limits of carbon content in the bath at the various changes in the spectrum indicate that the spectroscope may provide a very clear picture of the progress of the blow. Of particular interest is the time when the lines become persistent, the carbon content of the bath lying within the limits 0.86 to 1.00 pct, and the first appearance of the green line 5371 Å^o—which occurred between 1.54 and 1.65 pct C.

It is very interesting to note that appearance of the yellow line, which represents the sodium atom, does not occur at the time that the blow commences. It

Fe (slag), Lb	Loss in Earlier Stage, Lb	Total Loss, Lb	Total Chemical Loss, Pct	Total Loss, Pct	Mechanical Loss, Pct	Silicon Loss From Lining, Lb	Silica Loss From Lining, Lb
69	184	.....	.....	.....	.....	.....	.....
104	130.3	.....	.....	.....	.....	.....	.....
131	81.9	.....	.....	.....	.....	.....	.....
90	87.4	.....	.....	.....	.....	.....	.....
74	21.4	485.1	7.75	10.8	3.05	28.2	60.4
97	160.8	.....	.....	.....	.....	.....	.....
51	127.2	.....	.....	.....	.....	.....	.....
67	93.2	.....	.....	.....	.....	.....	.....
59	11.3	392.5	6.87	13.5	6.63	13	18.4
36	79.5	.....	.....	.....	.....	.....	.....
35.8	100	.....	.....	.....	.....	.....	.....
60	104.3	.....	.....	.....	.....	.....	.....
41.5	47	330.5	7.21	.....	.....	2	4.3

CONVERTER NO. 1
HEAT NO. 10
18-9-45

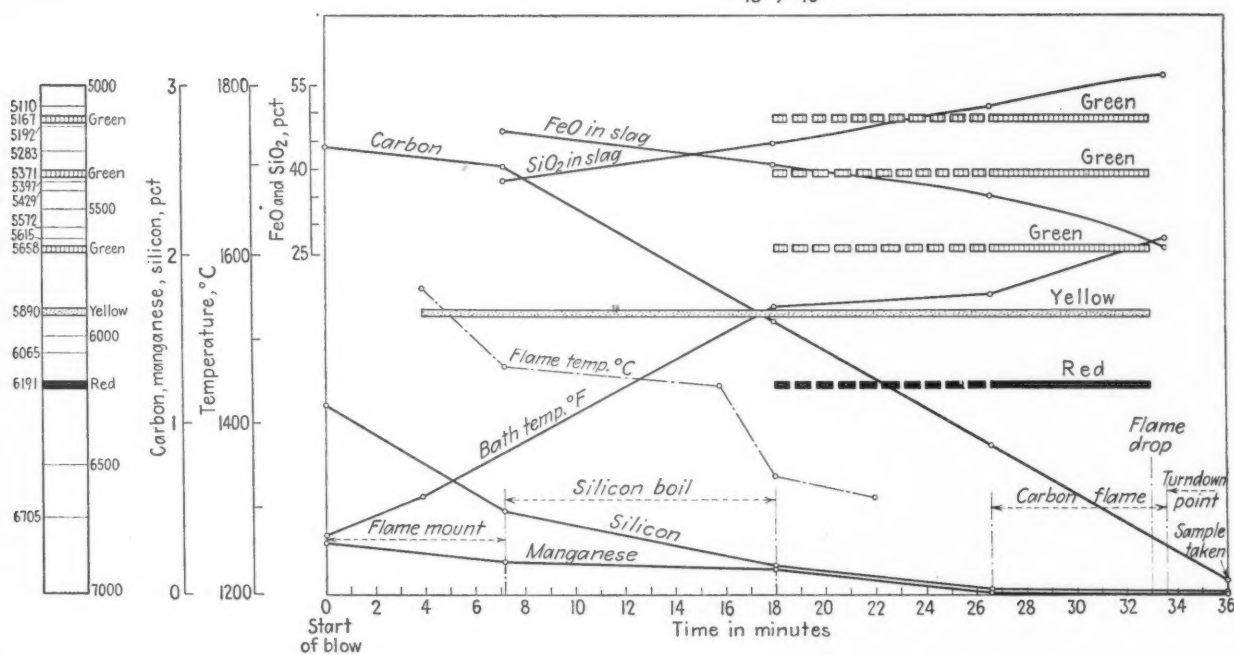


FIG. 7—Metallurgy of the converter process operated under different conditions than in fig. 6.

was observed that the time of appearance varies in different blows.

It is proper to assume that at one temperature only is the sodium compound decomposed and the sodium atom excited, and as a result of that, the yellow line is obtained in the visible spectrum range. It was established that when the initial temperature of the cupola metal was higher, the yellow line appeared soon after the blow commenced. When the temperature of the cupola metal was low, it took a longer time for the appearance of the sodium line.

This observation can be extremely valuable in everyday operations, in assessing the temperature of the cupola metal. It is common practice to add ferro-silicon during the converter blow, in case the operator cannot get metal sufficiently hot.

The addition is done rather haphazardly, and if done in the later stage of the blow, it is very uneconomical. The observation can give a definite guide as to what thermal condition exists in the vessel, although obviously, it requires further exploration. The appearance of an intermittent green line commences when silicon is nearly eliminated, and the bath temperature is about 1500°C (2732°F). Combustion of carbon monoxide formed from the decomposition of iron carbonyl is simultaneously taking place over the converter nose. The converter lining in this stage is at a temperature which does not permit the formation of carbon dioxide.

The evolved molecule of iron from the liquid bath will be decomposed as soon as it is formed and atoms of iron surrounded by molecules of carbon monoxide will travel rapidly to the converter mouth. The time required to reach the converter mouth is only a fraction of a second. The changes, which are taking place in the slag, do not allow the release of a continuous stream of iron atoms. When the slag composition is stabilized, or in other words, when an equilibrium condition is almost attained, the iron atoms are not

disturbed and a continuous atomic spectrum can be obtained.

In view of an entirely new outlook on converter metallurgy, it is necessary to consider the inevitable loss one can expect, and the possibility of decreasing the losses. The total converter loss can be divided into two parts; chemical loss and mechanical. The chemical loss is due to the elimination of carbon, silicon, manganese and iron. The mechanical loss is due to the escaping of liquid particles of metal covered or uncovered by slag. The iron lost chemically could be found in slag as iron silicate and in the converter flame as atomic iron. Chemical losses are unavoidable in any ordinary blow of the converter, although the chemical loss could be diminished if the converter could be blown to a certain carbon content. In table III it is noted that the second intermittent green line appears when the carbon content in the bath is about 1.55 pct, and the temperature is about 1500°C (2732°F). On the other hand the persistent green line appears when the temperature is about 1600°C (2912°F) and the carbon content is about 1 pct. The elimination of carbon in the second example is about 65 pct. It is clear, then, that the requirements of steels with carbon contents of 1.5 and 1 pct can be met by observing the electromagnetic spectrum in the range under consideration. What is more—losses in heats made in this manner can be cut to about 50 pct.

The mechanical loss depends on blowing time, vessel condition and vessel design. The exploration of the spectrum in the ultraviolet range could possibly give some idea as to how to finish the blow with a lower carbon content than the one at present. It may be possible by further research to find the means for correlating the length of time of existence of the persistent green line, with the carbon content in the bath. This may simplify the process to such an extent that a much wider application than at present will be

possible. Chemical losses in both experiments (see table II) are about 7 pct, but the total losses vary by about 3 pct. In the first heat, when the initial temperature was higher, the loss was lower than in the second case.

The protection of the metal by the slag, was, in the second experiment, insufficient; but at the same time the rate of oxidation of the metal by air was much higher. As a result of these two factors the temperature in the second experiment increased much more rapidly and the blowing time was shorter. The chilling action of cold air blown over the bare surface of metal is very pronounced, and as a result, the heat efficiency increases towards the end of the blow.

Flame Spectrum and Bath Temperature

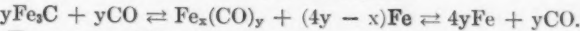
In view of the theory expressed that the spectrum bands are due to the presence of atomic iron in the flame as a dissociation product of iron carbonyl, there should be some connection between the appearance of the bands, the temperature of the bath and lining of the vessel. The formation and dissociation of iron carbonyl is dependent on the temperature in the vessel, and the temperature of the flame must be sufficiently high to excite the iron atoms so as to produce a visible spectrum. The initial measurement of flame temperature has proved that the temperature becomes sufficiently high to excite the atom only in the last stages of the process.

It appears from the optical measurements in the later experiments that the lines become persistent when the temperature of the flame had risen above about 2550°F (optical uncorrected).

The fact that iron, in the atomic state, is present in the converter flame, is altogether inexplicable by the standard assumption that the reactions in the bath take the form; $2C + O_2 \rightarrow 2CO$, and so on. The conclusion is reached that a volatile compound of iron is formed in the bath and dissociates in the atmosphere above the slag, yielding iron in the nascent state.

From laboratory experiments, it was found that the volatile compound formed is iron carbonyl— $Fe_x(CO)_y$. Of all the known carbonyls, $Fe(CO)_5$ is the most stable one.

Since the atmosphere of the converter flame is not excessively oxidizing in the latter stages of the blow, the atomic iron persists up to the nose of the vessel and beyond, and the temperature then being high enough, the iron atoms become excited and register their presence in the spectrum. This being so, an explanation of the converter flame spectrum and its connection with the composition of the bath becomes immediately available. Iron carbonyl is formed as a result of the reaction:



From considerations of free energy, this reaction can be expected to proceed from the start of the blow and to be maintained as long as there is carbon in the bath. As long as carbonyl is forming and dissociating, iron will be present in the atomic state at some point in the vessel, and as the temperature of the lining and the gases leaving the mouth rises throughout the blow, the atoms present in the flame become excited and the atomic spectrum is visible. The iron is in the nascent state and is oxidized almost instantaneously to iron oxide. As the carbon

TABLE III					
Correlation of Composition of the Converter Bath With Appearance or Disappearance of Certain Lines of Electromagnetic Spectrum					
	Exp. No. 1	Exp. No. 2	Exp. No. 3		
Bath temperature, °C...	1486	1547	1540	Green 5167A°	Intermittent
Carbon content, Lb...	1.54	1.94	1.59		
Pct carbon elimination.	46.8	28.7	38.8		
Bath temperature, °C...	1486	1564	15.40	Green 5371A°	Intermittent
Carbon content, Lb...	1.54	1.65	1.59		
Pct carbon elimination.	46.8	36.5	38.8		
Bath temperature, °C...	1486	1502	1540	Green 5658A°	Persistent
Carbon content, Lb...	1.54	1.23	1.59		
Pct carbon elimination.	46.8	39.4	38.8		
Bath temperature, °C...	1403	1300	1315	Yellow 5890A°	Persistent
Carbon content, Pct...	2.65	2.5	2.55		
Pct carbon elimination.	8.93	3.84	1.9		
Bath temperature, °C...	1518	1564	1540	Red 6191A°	Intermittent
Carbon content, Lb...	1.45	1.65	1.59		
Pct carbon elimination.	51.7	36.5	38.8		
Bath temperature, °C...	1590	1614	1550	5167A°	Persistent
Carbon content, Lb...	0.96	1.00	0.86	5371A°	
Pct carbon elimination.	66.8	61.5	66.9	6191A°	

content of the bath approaches 0.1 pct, the atmosphere above the bath becomes more strongly oxidizing as the carbon monoxide concentration falls and any iron present in the atomic state becomes oxidized to FeO as soon as it forms.

As soon as the flame starts to shorten, it contains an excess of oxygen and this is confirmed as the point at which the lines disappear from the flame spectrum.

Conclusions

The author feels justified in drawing the following conclusions:

- (1) Since metallic iron (metal) and iron oxide are difficult to excite in a flame so as to produce spectrum lines, their boiling points being high and vapor tensions insignificant at the experimental temperatures, iron seems to be present there in an easily excitable form.
- (2) Neither metallic iron, iron oxide, nor iron carbide produce a flame spectrum when present individually.
- (3) The flame spectrum of iron appears under those conditions in which iron carbide and oxygen are present simultaneously.
- (4) The spectrum is particularly intense during the strong boil, when carbon is eliminated by oxidation. It appears that this process is associated somehow with the existence of the previously mentioned easily excitable form of iron.
- (5) The presence of the atomic spectrum in the converter flame, correlated with thermal and chemical conditions of the metal bath, is a good indication of the progress of the blow.
- (6) Appearance of an intermittent green line is proof that the atomic iron appears near the mouth of the vessel, although concentration of the atoms present is not strong enough to give a strong emission spectrum. Nevertheless, this can be correlated with the definite bath temperature, the carbon content, and the carbon elimination.
- (7) Appearance of the persistent green lines can be correlated with the temperature in the bath, carbon content and carbon elimination.

Solid and Slush Type Zinc Alloy



FIG. 1—Typical zinc permanent mold solid and slush castings used for lamps. Some of the castings have inserts of brass tubing; others have tubes cast in place.

COMBINING both solid and slush type zinc gravity-pour permanent mold castings offers many unusual possibilities in producing decorative products for various specialized fields. There are sound economic reasons for the use of these types of castings in preference to diecastings, for these particular applications, the primary reasons being that while the casting rates in permanent molds are not as high as diecastings and properties are also lower, the costs are substantially lower also. The bronze molds used in producing these gravity-pour permanent mold castings cost much less than steel casting dies, do not, as a rule, require a machine for operation, and are readily adapted for casting some shapes that would be difficult and, in some cases, impossible to make in diecast form.

The net result is that the process is well adapted for certain products in which frequent style changes and moderate quantities of castings are needed along with shapes that lend themselves to permanent mold casting. Some of the products needed could be diecast but the quantities required do not, as a rule, justify the higher cost of steel dies over cast bronze molds.

Moreover, although the permanent mold casting has lower strength than a diecasting of the same section thickness, the strength is more than ample for the applications in question, especially as only light stresses are involved. It is also significant that the

permanent mold casting comes from the mold with considerable luster and comparatively little flash, hence preparation for plating or other applied finishes involve little labor and moderate costs.

Finally, but not least in importance, there is the ready application of certain zinc alloys to a special form of permanent mold work known as "slush" casting. In producing such castings, the mold is filled with molten zinc alloy but before all of the alloy freezes, the portion remaining in liquid form is run out and used again. Thus, the casting is only a shell, although it has adequate thickness. Space that otherwise would have to be formed by a core, often with undercuts

that would prevent withdrawal of a solid metal core, is produced without coring except that at the ends of the casting there are small removable cores that cost very little and usually are kept so hot that little or no flash forms at the openings.

Primary uses for the zinc castings here considered are found in the lamp and lighting fixture field. One of the prominent producers in this field is the Stadler-Neuwirth Corp., Long Island City, some of whose casting operations, equipment and products are here described. Decorative zinc castings of the type discussed in this article are shown in fig. 1. Other companies employ corresponding methods and equipment. But before dealing with these, the zinc alloys suited for permanent mold work deserve consideration.

The two zinc alloys generally recommended for permanent mold casting are the binary alloy containing 5.5 pct Al and the ternary alloy containing 4.75 pct Al and 0.25 to 0.50 pct Cu. In both cases, Horse Head special or equivalent special high grade zinc should be used, as the lead, tin and cadmium content must be kept to the same low limits set for zinc diecasting alloys to avoid network corrosion, with consequent growth and loss of strength.

The ternary alloy is the stronger (28,000 psi tensile and 3 ft-lb Charpy impact strength, as cast) and the more satisfactory for general use but does not cast quite so readily as the binary alloy. The latter, how-

Permanent Mold Castings

By HERBERT CHASE

Use of both solid and slush type zinc alloy castings, produced in gravity poured permanent molds, offers many unusual opportunities for the economical production of decorative parts in which the physical property requirements are not too high. This article explains in detail the procedure used to produce such castings for use in home floor lamps, covering particularly the making of the molds and pouring and slushing techniques. The economics of this type of casting v. diecasting is also touched upon.

ever, has lower initial strength (25,000 psi tensile and 1 ft-lb Charpy impact strength), and is subject to greater loss in strength in aging but can make somewhat thinner slush castings. The ternary alloy, however, makes slush castings thin enough for practical purposes and is used exclusively in the operations here described.

All the molds employed are cast very close to finished size in bronze and are of two general types. Molds for solid castings are often made in only two parts separated at a flat parting and are employed chiefly for comparatively flat castings such as lamp bases. In such molds, the casting is commonly about $\frac{1}{4}$ -in. thick, as considerable weight is desired in a lamp base, but the thickness is positively controlled as the mold remains filled except for a small amount of metal in the sprue hoe which does not affect the casting proper. In some cases, metal inserts are used in such molds.

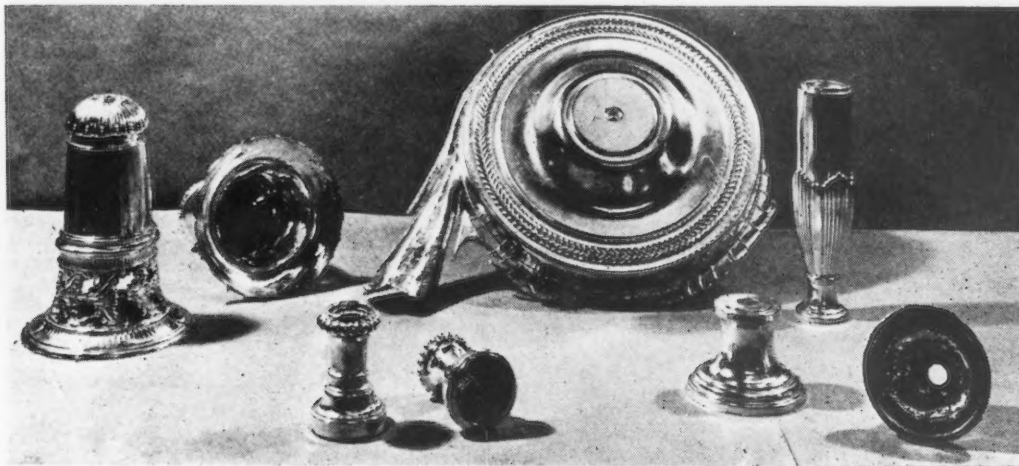
The second type of mold is for hollow or somewhat

tubular or bell shape parts serving as columns and shells (sometimes called "husks"). These molds are for slush castings and commonly are made in three or more sections in addition to cores which form end openings. There must be enough sections to clear the casting and to permit its removal from the mold.

In general, one end core is made hollow to provide an opening through which the mold is filled. Cores are turned from cold-rolled steel and commonly have a flange which fits an annular groove in the bronze sections of the mold. Some cores have a separate central pin with a head that forms a clamping seat or boss. This core makes it unnecessary to machine this seat on either side. Several slush castings and a solid base casting are shown in fig. 2, as they come from the molds. Fig. 3 shows a finished slush casting and a duplicate casting sawn in half.

To produce a mold, a pattern having the desired exterior shape and size of the casting wanted is first

FIG. 2—Another group of typical zinc alloy castings used in lamp manufacture. The parts are shown as cast and all except the large base are made in slush molds.



made, usually in wax or plaster. As a rule, this pattern has a design in low relief. The pattern is used indirectly to shape the cavity of the bronze mold, but the latter cannot be cast around this pattern alone as it would shape only one portion of the mold.

This pattern is used therefore to make one face only of each section of a plaster matrix, produced in two or more pieces, and the remainder of each piece of the plaster matrix is shaped, by a specialist in plaster molding, to produce plaster patterns such as are shown in fig. 4. The pieces of this matrix serve as patterns for sand molds which duplicate the pieces in bronze. Fig. 4 also shows the bronze mold castings produced in the respective dies.

Sections of the mold, as they come from the bronze foundry, are fairly smooth but joints at partings have to be filed or scraped and the matrix surface, which is to form the face of the casting, has to be scraped or chased and then polished. When this has been done, the bronze sections fit together just as the plaster matrix parts fitted. Some of these sections, however,

are provided with external projecting legs or handles to facilitate handling the parts, but the sections themselves nest to form the mold. Clamps must be applied to hold the mold sections together when each casting is made and, in the case of slush molds, end cores must first be inserted.

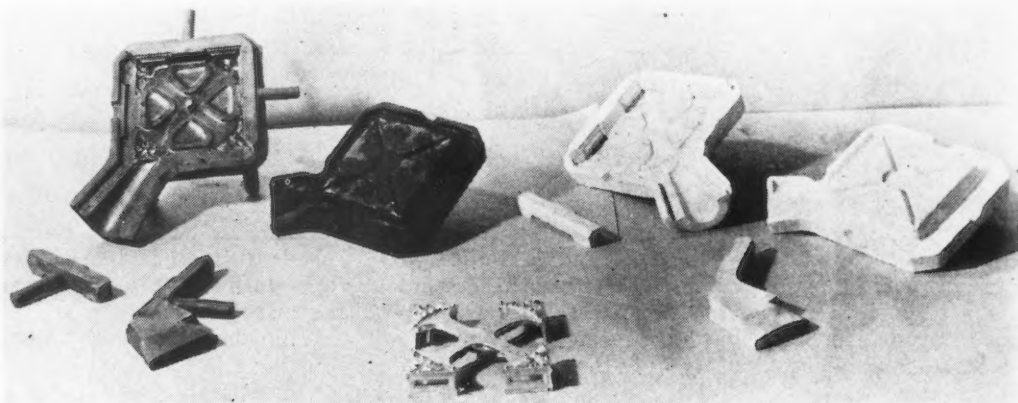
Each day, before molds are put into use, they are coated with stove polish which keeps the molten alloy out of contact with the metal of the mold and makes it easy to remove the casting when the mold is opened.

An assembled slush mold is shown being poured in fig. 5. As the illustration shows the mold is supported on tubes that act as trunnions and is held together by a C-clamp which the operator grasps to rock the mold slowly as he pours the molten metal from a ladle through the tubular core at one end. This slow rocking causes the metal to flow in a steady stream, without turbulence or spattering for if these occur surface imperfections are apt to result.

Pouring continues until the mold is filled and, after

RIGHT

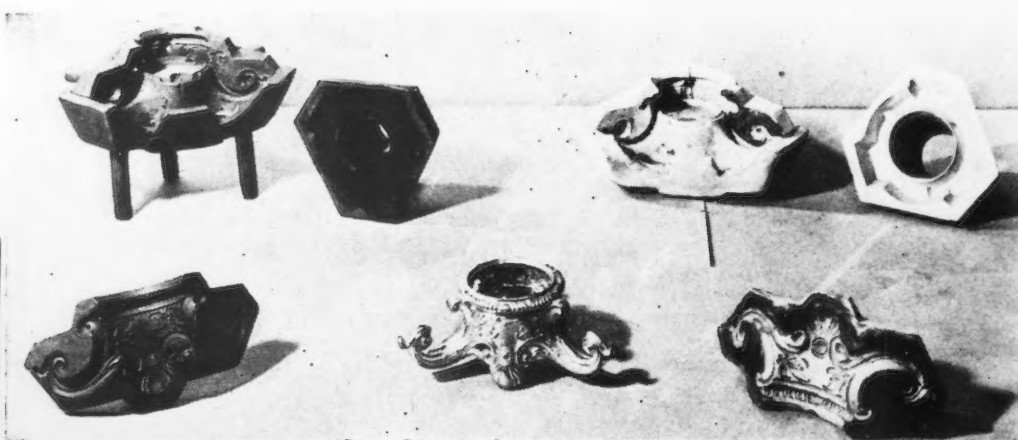
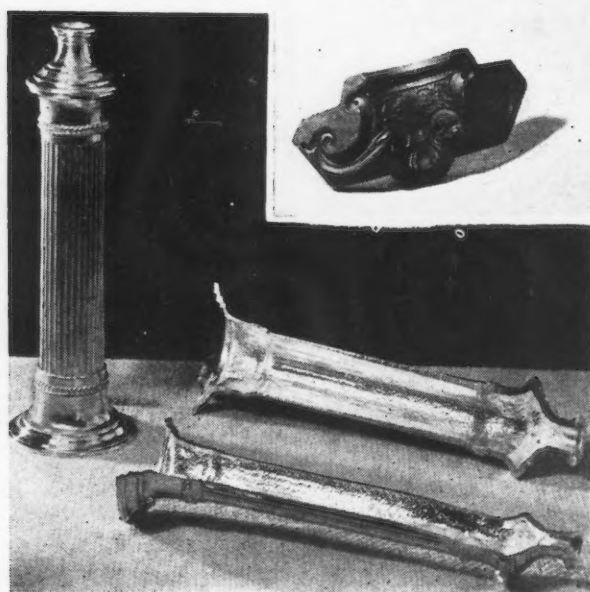
FIG. 4—Two bronze permanent molds are shown here. The mold in the top view is made in several pieces, each cast from the plaster patterns shown to the right. The zinc alloy casting produced in this mold is shown in the center foreground. The lower view shows a bronze mold made from the five similar sections of plaster patterns.



o o o

BELOW

FIG. 3—Slush cast lamp column and a section showing the casting interior. The wall thickness averages about $\frac{1}{8}$ in.



a few seconds elapse to allow a shell of metal to freeze against the mold walls, the mold is inverted and the remaining liquid metal is run back into the ladle and returned to the melting pot. Then the mold is shifted to the bench and is taken apart, as shown in fig. 6.

Parts of the mold are handled with tongs and are tapped with a rawhide mallet to free the casting. Parts of the mold are then laid on a board, rather than on the metal bench, (as can be seen in foreground of fig. 6) so as not to cool too rapidly. When the casting is free of the mold, it is held in a gloved hand while the operator strikes the cores with his mallet to free

them from the casting which is then laid on the bench to cool. Next, the operator places the two cores in position, located by their flanges, assembles the loose mold sections around the cores, applies a clamp, shifts the mold onto the trunnions in a casting position and is ready to pour another casting. Mold sections have to be kept at proper temperature which the operator judges by the castings produced. If molds are too cold, surfaces of the castings are likely to be rough and, if too hot, freezing will be too slow and will not give the desired surface finish. Cores, however, must be kept hot enough so that metal will not freeze in a complete shell around the inner end. Parts of molds are sometimes quickly dipped in water or water is poured on them to cool certain areas. Cores are sometimes laid



BELOW

FIG. 5—Pouring molten zinc alloy into a slush mold which the operator slowly rocks toward a vertical position as filling proceeds.



ABOVE

FIG. 7—Filling a slush mold for a bell-shaped part through the hollow core at the large end.

LEFT

FIG. 6—Removing sections of a slush mold preliminary to extracting the casting. Note the movable core in the end of the casting. Two sections of the mold are shown in the foreground.



on the edge of the furnace opening to maintain their temperature while the casting is being handled.

Fig. 7 shows the pouring of a bell-shaped casting of the slush type. Several of these castings are shown, with an open mold, in fig. 8. In this case, the four-piece mold is held together by a C-clamp and by a special U-shape steel clamp which straddles the mold and acts as the trunnion about which the mold is rocked while

being filled through the hollow core at the large end.

In this casting there is an openwork leaf design formed by rather deep relief on the mold wall, but the casting is kept thin enough to form the openings. If a thicker shell were allowed to freeze in the mold, the openings would be covered by metal. As can be seen in fig. 8, two mold sections have lips that overlap longitudinal joints but all are grooved at the ends to fit over the cores, the larger of which is not shown in fig. 8. The smaller core, shown in place, is made in two pieces, the inner piece having a stem that fits a hole in the surrounding core, and a head like that of a poppet valve.

When the casting is removed, this two-piece core comes away with the casting which is stood on the bench. A soft mallet is then used to drive out the valve-like core and to loosen the hollow portion that surrounds it. Metal has frozen, however, between the head and the body of the core and forms a boss around the cored hole so that a seat that needs no machining is produced. One short side core cast integrally with one mold section produces a hole in the side wall of the casting through which a switch button is later inserted.

Although a part, having a bell shape like that shown in fig. 8, probably could be diecast, the die would have to be made in four parts and would be quite expensive. There would also be much more flash in the openwork

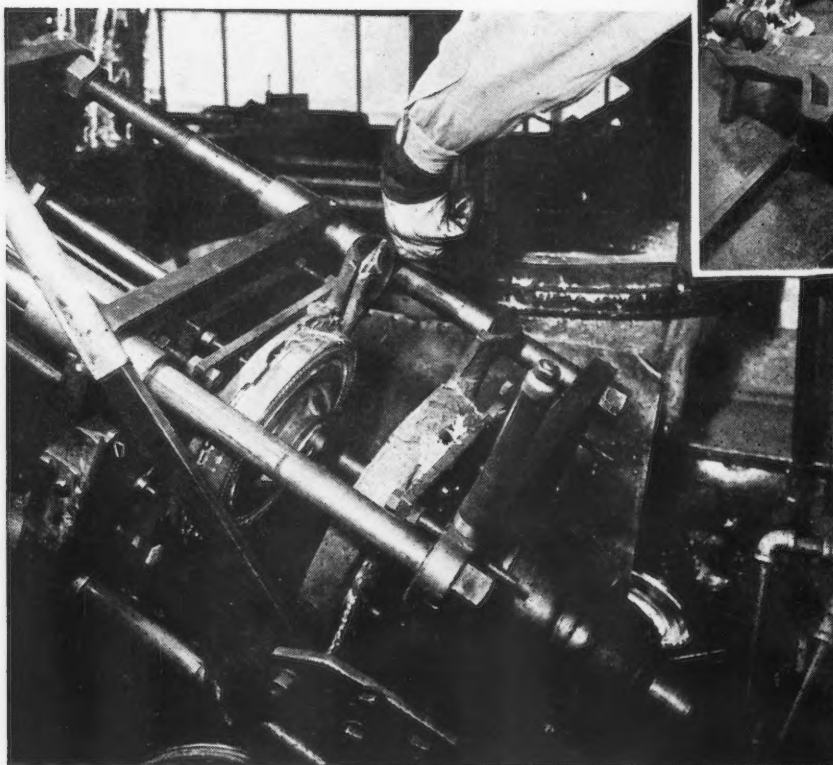
holes and at joints, and it would require much more work to remove this flash than is required on the slush mold. Castings shown in figs. 3 and 6 could not be diecast because the core needed could not be withdrawn from the castings.

Small solid castings, such as are produced in the mold shown in fig. 4, can be made at benches but are more often produced in a clamping machine similar to that shown in fig. 9, but of smaller size. Large bases, like that shown in the open mold in fig. 9, are cast in molds, the halves of which are fastened to platens of a machine which is really a light press arranged for air operation. The whole press is supported on trunnions so that it can be rocked with the mold as the latter is filled by a stream of molten metal that enters the cavity tangentially.

Operation of this machine is as follows: After the mold halves are fastened to the platens in correct alignment, an air valve is opened and the air operated plunger closes and locks the mold. The operator then fills a ladle from the metal pot and grasping the handle attached to the lower platen of the press, rocks the

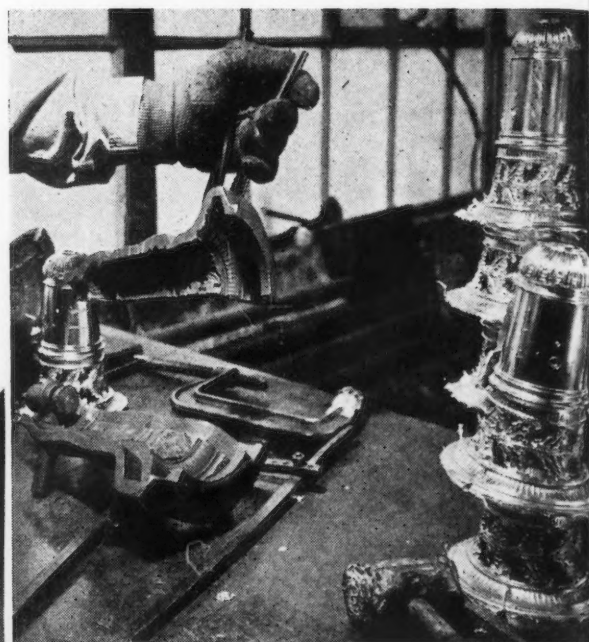
that grip the sprue, and the casting is laid on a bench to cool.

This machine is merely a convenient means for moving one half of the mold while the other is held stationary and locking the halves when the mold is ready to be filled. The whole machine is mounted over a pan of water, and if the mold sections become too hot, a ladle is used to pour a little water over that



machine and mold to the right so that the sprue hole is only slightly inclined. As the ladle is tilted and metal runs into the mold cavity tangentially, the mold is rocked slowly backward until, when filled, the sprue hole points upward.

After waiting a few seconds for the metal in the mold to freeze, the mold is again rocked to the right and any molten metal that has not solidified in the rather large tapered sprue hole is run back into the ladle and returned to the melting pot. Again the machine is rocked backward and the air valve is thrown to open the mold. This carries the casting to the position shown in fig. 9 and knockout pins, pushed forward as the mold approaches the end of its travel, free the casting from the mold and it is lifted out by tongs



ABOVE

FIG. 8—Assembling the slush mold in which the casting shown at the right is made.

o o o

LEFT

FIG. 9—Large permanent mold with casting being removed. The mold is positioned in an air-operated press which is mounted on trunnions so that both press and mold can be slowly turned as the mold is being filled.

part of the mold to be cooled. Then the mold is closed and the cycle is repeated.

With a machine of this type, experienced operators produce 200 or more castings per 8-hr shift unless unusual delays are encountered. The rate with hand operated molds, including the slush type, commonly ranges from 15 to 30 castings an hr, depending upon the size of mold, number of sections to be handled, time for core removal, etc., but molds as large as that in fig. 9 are too awkward and heavy to shift and clamp by hand at an economical rate. All slush molds, however, are hand operated.

Molds have to be brought up to and held at a temperature such as to yield smooth castings at a reasonable rate, the heat being supplied by the alloy which

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is poured at a temperature of 750° to 800° F. Molds that do not vent adequately through partings are provided with vent holes about 1/16-in. diam in which square plugs usually are set.

As can be seen from the illustrations, surfaces cast in contact with the polished but blackened mold come out bright and smooth. In general, there is little flash. Parting lines, though visible, are not prominent and are readily removed by the wheel polishing that precedes plating. Interior surfaces of slush castings are rough but, as they are not exposed, this is of no significance.

Brass or steel inserts are sometimes cast in place,

as in the part at lower left corner of fig. 1. In this particular case there are three separate castings, one formed around each of the bent tubes that project from a central stamped bowl. In other cases, as in casting at lower left center of fig. 1, inserts are applied after casting.

Castings made in the manner indicated are not only pleasing in appearance but are readily plated or otherwise finished and serve their purposes well. As the uses are largely decorative, it is not necessary to hold close dimensional limits but the castings are uniform in size and require very little, if any, machine work. Flash is often removed with a file or scraper.

Exhaust Unit For Fume Suppression

AN exhaust unit for suppressing obnoxious gases from lead baths, pickling tanks, galvanizing tanks, plating tanks, nitriding furnaces and spray cleaning booths in which cleaning solvent is used, has been designed by E. F. Fisher of Faraday Engineering Co., Boston.

A unit, which Fisher has used successfully in solving the fume-removal problems in connection with a synthetic lacquer spraying operation, has recently been applied to the operation of tempering steel blades of shovels. These blades are dipped in a molten lead bath while covered with a film of oil; the oil film causing dense smoke which was exhausted from the lead bath by means of a hood connected to an exhaust fan. The fan, hood and duct work soon became coated on the interior with oil which burst into flame whenever the oil film on the shovel became ignited from the heat of the molten lead. This occurred quite frequently and in addition to constituting a fire hazard, the duct work and fan suffered deterioration through warping. Another consideration was the fact that the dense clouds of smoke discharged by the fan created a nuisance in the neighborhood.

Fig. 1 illustrates the equipment designed to solve this problem, which was really threefold: (1) exhausting the smoke from the lead bath, (2) suppressing the flame after ignition, and (3) cleaning the discharged gases from the lead bath so that they would not constitute a nuisance.

A hood was designed to cover the lead melting tank similar to the old hood. This hood communicated with the inlet ends of a row of vertical venturi spray tubes which formed a passageway for the gases and which in turn communicated with a receiving chamber C. This chamber served as a sludge tank and a receiver for the cleaned air and was connected with the fan inlet.

All gases from the lead bath must pass down through these venturi spray tubes, which remove all solids from the gases and effectively prevent any flame from passing through them. The dirty water and sludge are drained from this chamber to a sump from which the water is recirculated through the spray nozzles. The exhaust fan handles only clean air at lower temperature and the duct system remains free from oil and sludge. The fire hazard is said to be completely eliminated and the smoke nuisance abated.

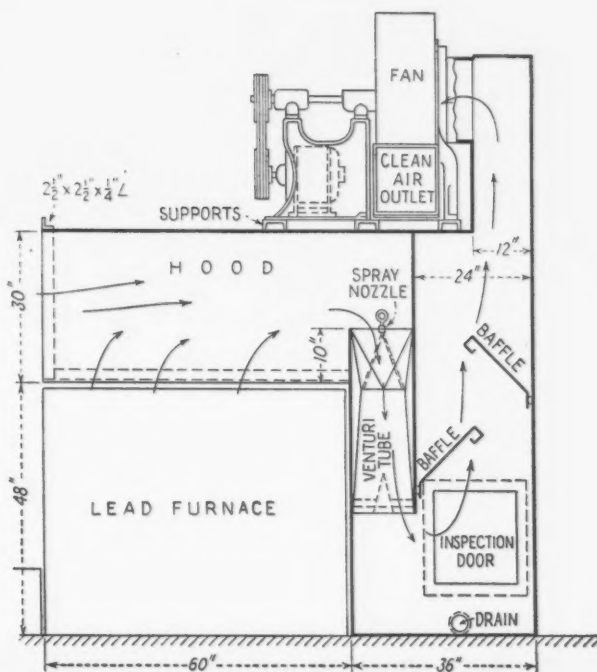
The exhaust fan would not be necessary if a short

discharge duct to the outside could be used as the water spray in the venturi tubes produce sufficient suction to pull the gases through the hood and discharge them through a short length of discharge duct.

In the synthetic lacquer spraying operation mentioned above, no fan was used as the discharge duct to the outside was very short and a water pressure of 60 psi was available, thus producing a powerful suction on the hood.

As it was necessary to discharge the gases from the lead bath quite a distance to the outside of the building, the old fan that had formerly been used was utilized in the new setup, and a lower pressure on the spray nozzles used.

FIG. 1—Exhaust hood and flame suppressor for lead tempering furnace.



Steel Officials Call



THE first Charles M. Schwab Memorial lecture was given by his former associate, Eugene G. Grace, Bethlehem Steel board chairman. Mr. Grace delivered a warm personal talk on Mr. Schwab, regaling his listeners with some little known anecdotes in the life of the great steel pioneer. Walter Tower, president of the American Iron & Steel Institute is the gentleman at the right. In the background is Quincy Bent, Bethlehem Steel Co. vice president.

THE steel industry's frame of mind this week resembles that of the healthy man who started to read the medical book. At least that is the impression one gets talking to steel men who attended the American Iron & Steel Institute annual meeting at New York last week. The reading of symptoms sometimes produces a temporary condition which simulates actual case histories. Maybe before long current steel symptoms may show the book was right.

Most speakers at the general sessions were quick to warn that everything which is bright is not necessarily rosy. Chief eye-opener in this trend of thought was Walter S. Tower, institute head, who drew comparisons between the immediate period after World War I and current conditions. Arguments from Washington that the steel industry should greatly enlarge its capacity were given a quick brushoff by Mr. Tower.

In the midst of a steel demand situation which is taxing all of the industry's equipment and even supporting, for a few more months at least, a temporary gray market, other speakers such as Wilfred Sykes, Inland Steel Co.'s president, claimed current steel capacity is ample for years to come. Mr. Sykes' statistics were based primarily on per capita steel consumption from 1920 to 1940. Still with a technical and general session which reached a new high in information and guidance, most steel sales and research officials were scanning the horizon for any possible signs of a let-up in the current rush for steel products.

Most of these steel pulse-takers privately agree that

the current high level of demand and operations cannot last indefinitely. Most of them look for a price and production correction somewhat similar to the 1937-38 period. Few if any are willing to concede that the drop-off in the operating level will be as severe as in the 1919-20 period. That doesn't prove, however, that 1948 experience will not be similar to 1920. Like other major industries the self-analysis and the attempt to more accurately gage demand cycles will probably put the steel industry in a far better long-term position.

An \$800,000 program in daily papers and rural weeklies to promote a better public understanding of the steel industry was announced by Edward L. Ryerson, chairman of the institute's public relations committee. The bulk of the program will be directed to the 50 million people who live in the 175 communities where steel plants of the institute's member plants are located, Mr. Ryerson reported.

E. H. Lever, chairman of the British steel firm of Richard Thomas & Baldwin's, made an extemporaneous talk stressing the fact that the whole tempo of Britain's economic welfare depends on steel. We need steel, and we need it badly, he pleaded. Commenting on the current crisis in his country Mr. Lever declared, "We shall pull through! But it will be faster with U. S. cooperation and help."

The technical section of the institute meeting consisted of a series of meetings on Wednesday afternoon covering raw materials; shaping and forming; coke ovens, blast furnaces and steelmaking furnaces and

ls Call Present Capacity Ample

Speakers at 55th meeting of American Iron & Steel Institute decry expansion hysteria . . . Stress need for caution with buyers' market coming . . . Use of oxygen for carbon reduction discussed . . . Benefits of high top pressure in blast furnaces cited.



HERMAN F. DOBSCHA, superintendent of blast furnaces, Edgar Thompson Works, Carnegie-Illinois Steel Corp., was awarded the American Iron & Steel Institute medal for a paper on iron ores in the blast furnace presented at the 1946 institute meeting.

general metallurgy. Unfortunately space does not permit publication of abstracts of all the excellent papers presented at the technical sessions. However abstracts of several papers of general interest are published herewith. Complete copies of all the papers will be made available later by the institute.

Because steel salesmen will soon have to reverse their tactics and actually use their efforts in selling steel and because wage rates and material costs are the highest in the industry's history, technical discussions and general sessions at the institute meeting last week were attended in record-breaking numbers.

Speakers Refute Need for Expansion

Walter S. Tower, president of the institute, speaking at Thursday's general session, reminded his hearers that "steel was riding high on a wave of optimism" when they met in May of 1920. "Steel is riding high as you meet here today. I hope that the similarities may not hold beyond this point."

Some of the very persons who are urging a sizable expansion of steel ingot capacity today are those who were convinced 10 years ago that the steel industry was overbuilt, expanded beyond the needs of the country, Mr. Tower asserted. The clamor for steel today, he said, recalls the steel industry's experience of 27 years ago following the end of the first world war. "It was then that the idea of 'accumulated shortages' gained popular acceptance," Mr. Tower pointed out. "Then too, we heard about a steel starved world. Some prophets of that day saw visions of at least '10 years of unbroken and unparalleled prosperity for the steel industry.' The very next year your furnaces operated at 35 pct of capacity."

Commenting on the 200 million gross ton estimate of

the steel lost to peaceful arts during World War I and its predicted strong supporting influence on the world's markets for many years to come, Mr. Tower pointed to the cold fact that over the following 5 years the rate of operations for the whole steel industry averaged 60 pct of capacity and only one of the 5 years topped 75 pct.

Present steel capacity of more than 91 million tons would seem to be ample for our future needs for many years to come, Wilfred Sykes, Inland Steel Co.'s president believes. He based his analysis on domestic per capita steel demand for the 1920-1940 period which indicated that the peak per capita demand was 978 lb in 1929. This peak rate, plus allowance for 6 million tons of steel for export would keep only about 84 pct of the industry's capacity in operation in 1950, and only 86 pct in 1955. He submitted these figures:

Year	Population Estimated	Maximum Annual Per Capita Demand In Pounds of Ingots		
		Domestic	Export	Total
1950	143,896,000	978	83.5	1061.5
1955	148,186,000	978	81.0	1059.0

Year	Present Capacity	Maximum Consumption		Per Cent Rate of Operations
		Tons Steel Ingots		
1950	91,241,250	76,373,000		83.7
1955	91,241,250	78,464,000		85.9

Squelching the worriers on iron ore supply, Mr. Sykes concluded that "there is adequate iron-bearing material to meet our future needs for centuries to come." Aside from beneficiation, the unexplored regions of Canada north of the Great Lakes and unproven deposits in Labrador offered promising prospects, he said.

Mr. Sykes advanced two reasons for probable continuing scrap shortages: (1) today's steel lasts longer; and (2) increasing tonnages are going into light gage rolled products, little of which returns as scrap. This

means, he said, increasing use of hot metal, and the eventual availability of low cost oxygen will permit use of increased percentages of hot metal.

E. G. Grace added a lot to his listeners' fund of lore on Charles M. Schwab. In one anecdote, after telling how Mr. Schwab had been turned down by the bankers, the present Bethlehem board chairman touched on some of the Schwab miracles in early Bethlehem financing, saying, "He got all of the building contractors to accept notes ranging from \$20,000 to \$200,000 each. The excavating contractor agreed to complete nearly a half-million dollars' worth of work on open account, and offered a loan besides. He prevailed upon several banks, both in Philadelphia and Bethlehem to take various notes of \$200,000 each. He prevailed upon the directors of both the Lehigh Valley and the Philadelphia & Reading to accept freight on credit."

In his talk to members of the institute "tinkering in high places" was blamed by Charles E. Wilson, president, General Electric Co., for the present situation in which many manufacturers have "no real alternative but to increase wages and kick prices a little higher in order to bail out." Mr. Wilson criticized the principal distortions in the price structure

with particular reference to raw materials, farm products and clothing, stating that this could not be corrected by direct action but "must wait on the lapse of time, higher productivity and the operation of natural forces."

He said that the two ways in which prices can be brought down in a free economy are: (1) they can be reduced from manufacturer to distributor to retailer, which plan will be put into practice just as soon as it can; and (2) prices can be reduced at the bottom of the structure because buyers will not or cannot buy. He called the second course "the path of depression."

Dr. George S. Benson, president, Harding College, Searcy, Ark., delivered the concluding talk of the 2-day session, addressing the dinner meeting on May 22. Americans should remain aware, he said, that "the great undercurrent is still moving in favor of nationalization of American industry. If America is to survive, proper industrial relations must be achieved."

Dr. Benson asserted that the United States is as far on the road toward nationalization of industry as England was at the close of World War I, and that "unless we can change the trend of thinking in this nation another crisis will bring us into nationalization of industry and into mediocrity for everybody."

Use of Oxygen for Carbon Reduction

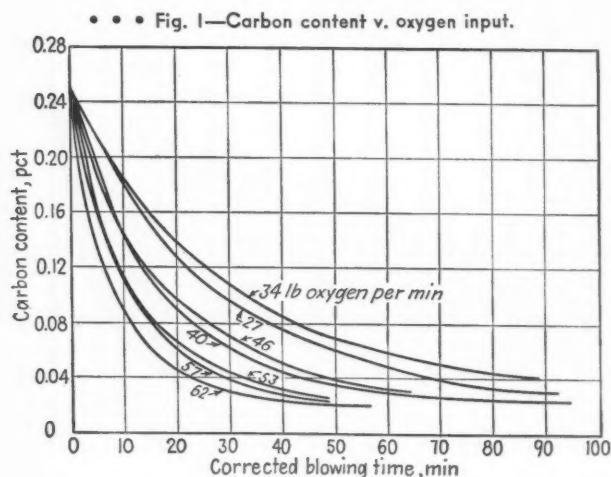
RESULTS of metallurgical studies of the factors governing the rate of carbon removal and the economics of the oxygen blow were discussed by G. V. Slottman, manager, Technical Sales Div., Air Reduction Co., New York, and F. B. Lounsberry, vice-president and technical director, Allegheny Ludlum Steel Corp., Brackenridge, Pa., in their paper entitled "The Use of Oxygen in the Open Hearth Practice for Carbon Reduction."

The purpose of this paper is to discuss the metallurgical phenomena associated with the use of oxygen during the refining period in openhearth steelmaking and to supplement information previously published.¹ The authors, in endeavoring to explain the uncertainty surrounding the nature of the decarburization reaction, base their considerations upon the fact that former calculations were based on oxygen being supplied to the bath, (through the slag) from the oxidizing atmosphere while the introduction of oxygen directly

to the metal bath in the form of gaseous oxygen presents a clearer picture of the reaction. The interchange of oxygen between the metal and slags of constant basicity can thus be studied at high rates of decarburization and with varying rates of oxygen supply.

The type of data obtained by plotting slag and metal analyses against oxygen blowing time is indicated in the article entitled "Use of Oxygen in the Openhearth Bath," (fig. 4)¹. Varying the rate of oxygen supplied from 27 to 62 lb per min (330 to 810 cfm) with an effective blowing time amounting to 45 to 75 pct of the total blowing period results in a plot such as shown in fig. 1, which contains a plot of the carbon content v. corrected blowing time for various rates of oxygen input. The term corrected blowing time indicates a consideration of the fact that some oxygen also enters the slag-metal system from the furnace atmosphere. Such typical carbon drop curves show a rapid decrease in the rate of decarburization in the region of low carbon contents. Considering experimental error, which is relatively high in all plant-scale tests, it is obvious that the rate of decarburization at any given carbon content is roughly proportional to the rate of oxygen input.

Conversion of the data obtained to represent efficiency indicates that the rate of carbon elimination varies with the rate of oxygen input, and that the efficiency factor expressed as pounds of carbon removed per pound of oxygen input is relatively independent of the rate of oxygen input, but varies largely with the bath carbon. With carbon contents below 0.25 pct, the decarburizing efficiency of oxygen diminishes rapidly, and in the region below 0.05 pct C, the bulk of the oxygen is entering the slag as iron oxide



¹"Use of Oxygen in the Openhearth Bath," THE IRON AGE, Feb. 27, 1947, p. 42.

²Fetters and Chipman, AIME, Iron & Steel Div., vol. 140, 1940, p. 176.

diffusing or precipitating from the metal. The rapid increase in slag oxygen content with bath carbons below 0.05 pct confirms this deduction and it is apparent that an equilibrium exists between the slag and metal oxygen contents which can be approached either from the slag side, as in normal practice, or from the metal side with the direct addition of oxygen to the metal. Comparison of analysis data against the standard equilibrium curve for openhearth practice² shows that the oxygen content of the steel within a very few minutes of stopping the oxygen blow approaches the equilibrium curve. During the oxygen blow, the oxygen content is slightly higher than the equilibrium value.

Plotting slag iron oxide content (as FeO) against the reciprocal of the carbon content shows an apparent correspondence between oxygen blowing rate and the iron oxide content of the slag. At high blowing rates, the iron oxide content of the slag is lower than at lower rates for a given carbon content, indicating that the greater the blowing rate, the further the slag oxygen content will be from equilibrium with the oxygen content of the metal. The lower iron oxide content of the slag for a given carbon content at high rates of blowing has an economic significance, since it affects the ingot yield when comparing the use of gaseous oxygen with the addition of ore to form an oxidizing slag. Balancing the factors involved, it is apparent that metal yields when using gaseous oxygen at high blowing rates can be as high or higher than with normal ore practice.

A consideration of the behaviour of manganese also comes under discussion, since the relationship of carbon to manganese is not a simple one. Since the oxidation of manganese also requires oxygen, a correction factor for manganese oxidation in the low carbon ranges must be included in the efficiency factor based on the rate of carbon drop. The effect of the varying efficiency of oxygen in removing carbon and manganese is shown in fig. 2, which indicates total oxygen from the two sources of oxygen input to the metal-slag system and the distribution of oxygen between the carbon and manganese oxidation reactions and the oxygen entering the metal and slag at various carbon levels. The sharp decrease in efficiency at low carbon levels is plainly evident.

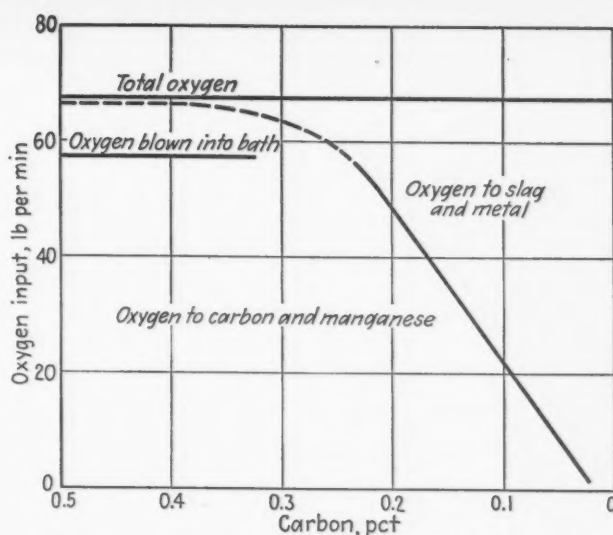
In order to obtain a clear understanding of the mechanism of the oxygen-carbon-manganese reaction, the authors introduced the concept of an efficiency factor expressed as:

$$E_f = 0.03 \frac{(O_s - O_c)}{O_c}, \text{ where } O_s$$

High Top Pressures in Blast Furnace Operation

AN IMPORTANT advancement in blast furnace operation, of special significance to that part of the American steel industry dependent on Lake Superior iron ore, was reported by J. H. Slater, assistant district manager, Cleveland District, Republic Steel Corp., Cleveland, in a paper entitled "Operation of the Iron Blast Furnace at High Pressure."

Known within the industry as "pressure blowing," the new technique gives every indication of achieving (1) greatly increased output of iron from existing furnaces to which it is applied, (2) use of Lake Superior iron ores now considered unusable by reason



• • • Fig. 2—Typical decarburization heat.

is the oxygen content of steel at saturation—assumed to be 0.23 pct oxygen at 0.012 pct C for temperatures in the openhearth range—and O_c is the oxygen content corresponding to equilibrium at any carbon level.

In interpreting the data obtained, the diffusion factor ($O_s - O_c$) and the effect of oxygen entering the slag from the metal were considered to be the dominant influences on the rate of carbon and manganese removal. An equation was derived to cover the experimental data in the form:

$$\frac{dc}{dt} = 0.03 \frac{do}{dt} \frac{(O_s - O_c)}{O_c},$$

where $\frac{do}{dt}$ is the rate of oxygen supplied and

$\frac{dc}{dt}$ is the percent of carbon drop per minute.

This equation can be integrated to the form

$$T = \frac{1680}{do/dt} \log_{10} \left[\frac{0.23 (C - C_{min})}{C_1} \right]^{C_2}$$

where it will serve a useful purpose, since it will indicate the time required to reduce the carbon content to any desired end point (for a constant rate of oxygen supply), as well as the total volume of oxygen required. In this integrated form, $\frac{do}{dt}$ is the sum of the oxygen blowing rate and the rate of oxygen pickup from the gases.

of the expense of preparing them for conventional blast furnace practice, (3) lower coke consumption per ton of iron produced, and (4) ultimate reduction in cost of iron production, all other present costs remaining constant.

Two furnaces operated by Republic Steel Corp., the new Cleveland No. 5 and the Youngstown No. 3, have been guinea pigs in experimental work started during the war as part of the government's effort to step up iron and steel production. Arthur D. Little, Inc., Cambridge, Mass., has been collaborating with Republic in the work on pressure blowing.

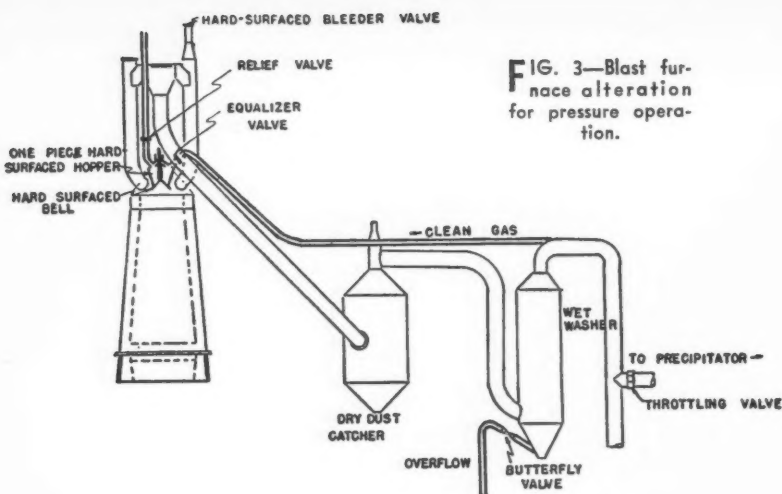


FIG. 3—Blast furnace alteration for pressure operation.

The changes required in blast furnace construction to permit a furnace to be operated under high pressure may total from \$70,000 to \$150,000, depending on the furnace, provided sufficiently powerful blowing equipment is already available. However, because of the tremendous cost of the huge complicated blast furnace, such a cost would probably not exceed 1-pct of the capital investment.

Importance of the technique to the lake iron and steel industry lies in the ability of a pressure blown furnace to use finely divided ore without production of excessive flue dust. With the exhaustion of high-grade Lake Superior open-pit ores probable in a decade, the technique of pressure blowing appears to be a great step toward the utilization of lower-grade ores now regarded as unusable.

Productivity of a blast furnace varies directly to the amount of air blown into it. It takes roughly four tons of air (100,000 cu ft) for each ton of iron produced by the blast furnace. The shorter the time necessary to blow that amount of wind into a furnace, the quicker the ore is reduced. This in itself would indicate that increased production was simply a matter of bigger and more powerful blowing devices, a conclusion which is modified by certain economic and physical factors.

When the volume of wind is increased to too great an extent, it passes through the furnace with such velocity that large quantities of fine iron ore are blown out of the furnace with the escaping carbon gases. The excessive loss of this flue dust makes operation at high wind volumes economically impractical.

New Seamless Pipe and Tubing Mill

A DESCRIPTION of some of the outstanding features of a new mill being built at Lorain, Ohio, by National Tube for the production of seamless pipe and tubing below 4½ in. OD was given in the paper "Progress in the Manufacture of Steel Pipe with Particular Reference to Seamless Pipe," by E. N. Saunders, operations vice-president, National Tube Co. This new mill is expected to produce pipe and tubing at production rates unattainable on existing conventional seamless mills, and boasts features which will permit the rolling of tubes of lighter walls and

This condition is augmented by the fact that the rapid passage of air through the furnace prevents the coke from contributing its full ability to reduce the iron ore, thus causing increased coke consumption per ton of iron produced.

In pressure blowing the advantages of large wind volumes without the previously mentioned disadvantages are achieved. This is accomplished by structural changes in the furnace to restrict the flow of escaping gases as desired. At the same time, powerful turbines blow large quantities of air under greater than normal pressures into the bottom of the furnace. Consequently, the air and gases move upward through the furnaces in greater volumes but at a much slower velocity.

The changes required in blast furnace construction, see fig. 3, consist essentially of the following:

1. A one-piece hopper to insure a tight seat for the big bell. At the Cleveland No. 5 furnace the contacting surfaces of the bell and hopper are hard-surfaced. At Youngstown a standard bell and one-piece hopper are being used.

2. Equalizer valves operated to equalize the furnace and between-bell pressures when the big bell is dumped. Two systems are in use, that at Youngstown employing clean furnace gas from the wet washer for equalizing, and that at Cleveland utilizing dirty gas from the furnace.

3. Wet washer level, hand-operated control to prevent blowing of washer seal.

4. Throttling valve to regulate top pressure.

Mr. Slater disclosed that the Cleveland No. 5 furnace has been blown at a rate up to 110,000 cfm during the past 6 months. In normal blast furnace practice, volumes of 75,000 cfm are rarely exceeded.

Since last August the Cleveland furnace has been operated under pressure with a burden of no better than average ore and coke and with no scrap added. Under this lean diet the furnace has produced all-time corporation record tonnages.

Blast pressures up to 30.5 psi have been used as against a normal of 20 psi to 25 psi. Mr. Slater forecast that with huge new turbo blowers now being manufactured, volumes up to 125,000 cfm under as much as 50 lb pressure might be blown in blast furnaces.

with dimensional tolerances not possible on conventional or automatic seamless mills. The paper also reviewed the factors which led to the company's abandoning the lapweld process in favor of seamless.

Because of inherent characteristics which have been associated with the conventional seamless manufacturing method, the author stated, the product of this process has not been competitive in cost with the small sizes of standard pipe which constitute 87 pct of this market and about 35 pct of the total tonnage of pipe produced in the United States. To permit seamless

pipe to be competitive in this market required a reduction in the cost of material, as well as conversion cost. Economies are being effected through designing this new seamless mill to utilize much larger sized rounds than heretofore for the same pipe size. A parallel installation of a high production blooming and bar mill will give the desired results.

Since the weight of a round bar increases as the square of its diameter, and the surface only as the diameter, it will be evident that these larger rounds have reduced the amount of surface to be conditioned and thus have decreased the loss of material in the surface preparation. The reduced area to be conditioned, together with an improvement in surface which has been brought about by developments in mold preparation and teeming practice, have effected further economies in the manufacture of seamless tube rounds.

Improvement in the quality of heating, reduction in labor, and an incidental reduction of 65 pct of the scale loss formerly incurred, represent the most attractive features of the rotary hearth furnace. This reduced scaling reflects a 2 pct saving in the overall cost of material. Full use of this modern type of equipment is being made on the new seamless mill.

Without changing the roll surface speed or the feed angle, modifications which have been made in the piercing pass have increased the delivery speed of the piercing mill 100 pct. The process which is being utilized in the seamless mill now under construction employs two operations entirely different in charac-

teristics from those of the conventional process and which replace those operations just mentioned. The first of these is the continuous tube rolling mill which consists of nine tandem, individually powered stands of two-high grooved rolls. The rolls in the consecutive stands have their axes at 90° with each other. The motors driving these roll stands aggregate 8500 hp.

The second operation, which replaces the reeling and sizing operations of the present day seamless mill, is a tension reducing or stretch mill. This mill, which is similar in construction to the continuous rolling mill, consists of 16 two-high roll stands with individual stands powered by 200 hp motors. Tension reducing, which has recently been developed by the company, is unique in that without the use of a supporting mandrel the wall thickness is diminished while the diameter is reduced. In the tension reducing mill the tension forces to which the tube is subjected between roll stands are not only effective in reducing the wall thickness of the tube but, in addition, make possible diameter reductions in successive stands more than 20 pct greater than can be made in the conventional mill. The faculty of permitting the entering tube wall to be maintained or reduced while large diameter reductions are being made in successive stands permits a single entering tube size to be employed for the production of all tube sizes in the size range 3½ in. OD to 0.675 in. OD.

The seamless unit now under construction has a rated monthly capacity of 18,000 tons and will produce seamless pipe in the size range 2 to 4 in. inclusive.

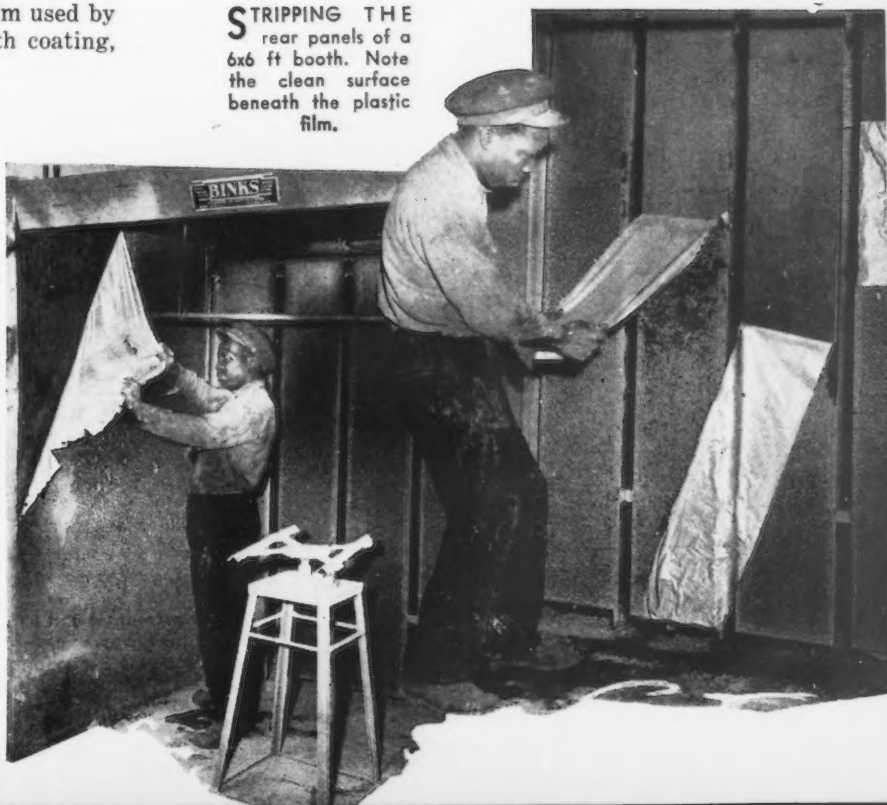
A REDUCTION in the time required for scraping down a japanning spray booth has been cut from 2 hr to 5 to 10 min by use of a peelable plastic film, according to Walter Lynch, president, Reliable Japanning Co., Newark. The accompanying illustrations show the ease with which a week's accumulation is stripped from a 6x6 ft spray booth. The film used by the company is Liquid Envelope spray booth coating, a product of Better Finishes & Coatings, Inc., Newark.

The spray booth coating is applied to clean walls with standard spray guns to a thickness of 0.002 to 0.005 in. No greasing or other preparation is required. To remove the coating, a corner is broken with a putty knife and the accumulations are peeled off in large chunks.

According to Mr. Lynch, it previously required more than 2 hr each week to scrape down a booth, but by using the new spray booth coating, the booth can be stripped in 5 to 10 min. In addition to the time savings, Mr. Lynch points out that the spray booth operators are glad to escape the scraping chore and the coating also gives better fire-safety.

Plastic Film Cuts Spray Booth Stripping Costs

STRIPPING THE rear panels of a 6x6 ft booth. Note the clean surface beneath the plastic film.



Penetration and Welding Speed in Contract Arcwelding

Weld penetration in the contact arcwelding process is appreciably deeper than with conventional electrodes and, as the author explains in this article, which originally appeared in the Philips' Technical Review, welds made by this method are stronger and less subject to undercutting. The use of heavy electrodes for the first pass, together with the higher heat efficiency of the contact electrode, results in an increase in welding speed of as much as 50 pct, and distortion is virtually eliminated as shown herein.

□ ○ ○

By P. C. van der WILLIGEN

N. V. Philips' Gloeilampenfabrieken, Eindhoven, Holland

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RECENTLY a new method of welding, called contact arcwelding, was described¹ in which the electrodes can be kept resting on the workpiece from beginning to end, while the coating of the electrode is in continuous electrical contact with the

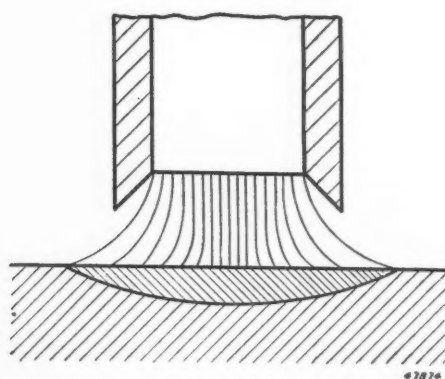
¹THE IRON AGE, Dec. 12, 1946, p. 58, and Philips' Technical Review, June 1946.

workpiece. This new method was the outcome of an investigation carried out with the object of making touch-welding easier and of more universal application. With contact electrodes touch-welding can be carried out easily without fear of troublesome freezing. This is due to the fact that the coating of the electrodes is made very thick by transferring a considerable part of the metal from the core wire to the coating. At the same time this makes the coating slightly conductive, and this conductivity can be regulated in such a way that the electrode becomes self-starting. This does away with the necessity of striking the arc by tapping and prevents losing the arc when welding with alternating current.

A question which deserves particular attention in welding is the shape of the penetration. By this is meant that part of the workpiece that is fused during the welding. When a bead is welded on a flat plate, the penetration resembles a segment of a circle, as shown diagrammatically in fig. 1 for an ordinary coated electrode.

In the first test with the heavy contact electrodes, however, it was found that the shape of the penetration differed considerably from the normal, the penetration being deeper in the middle and shallower at the sides, as shown in fig. 2. This different shape of the penetration is characteristic of all contact electrodes.

The explanation of this particular shape of the penetration is not difficult to find, considering that the arc burns only on the core wire; since in contact electrodes the core wire has only a relatively small surface, the arc is more concentrated than in the case of ordinary electrodes where the core wire has a relatively large surface. The spraying action of the

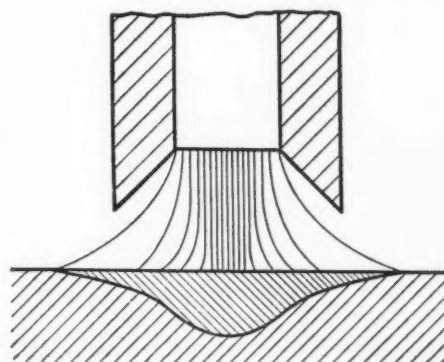


LEFT
FIG. 1—With a conventional type of electrode the weld penetration takes the form of a segment of a circle and is quite shallow in relation to its width.

○ ○ ○

RIGHT

FIG. 2—With the contact electrode the arc is more concentrated than with ordinary electrodes, and the penetration appreciably deeper at the center.



welding arc, which is the result of the forces acting on the molten droplets and which, for example, makes overhead welding possible, will therefore, in the case of contact electrodes, also be more concentrated in the center. Moreover, the longer cup of the contact electrode keeps the droplets better directed, resulting in less spatter. Further, the great depth of penetration in the middle is undoubtedly due to the arc voltages of the thicker contact electrode being appreciably higher than those of the corresponding ordinary coated electrodes containing the same amount of metal.

It is a known fact that electrodes having a high arc voltage give a deep penetration. The relatively shallow penetration at the two sides can now be understood, for here the arc burns only more or less laterally.

The peculiar form of the penetration with contact electrodes is in many cases of the greatest importance, for the following reasons. In the first place, the deep penetration in the middle makes it possible with V welds (and of course with fillet welds made in the flat position) to apply a first layer directly with a heavy contact electrode, say with a core diameter of 3/16 or 1/4 in. It is unnecessary to deposit a first layer with an electrode of small diameter. The result is fewer layers and saving of time, as well as other advantages.

It is to be noted that with a certain diameter of Contact Rod 15 the arc voltage is closely dependent on the current used; with high current the arc voltage is highest. Fig. 3 shows the relation between arc voltage and current for Contact Rod 15-5. (The number 5 indicates the diameter of the core wire in millimeters.) As was to be expected, the penetration is also found to depend very much on the current.

When a fillet weld is made in the flat position with two strips of 1/2-in. thickness, successively with different currents, and the depth of the penetration, the so-called root penetration, see fig. 4, is measured on the cross-sections, the result shown graphically in fig. 5 is obtained. A similar graph could also be drawn for V welds; the relation between the current and the root penetration would be found to be qualitatively the same. It is therefore clear that when making, for instance, an open V weld with backing strip, and using Contact 15-6, a high current must be used for the first layer in order to secure sufficient penetration to the bottom of the weld.

In the second place, due to the slight penetration at the sides, even when the heaviest contact electrodes and the highest currents are used, no trouble is experienced from undercut, i.e. burning away of the original material at the edges of the bead. Undercut, which reduces the strength of the welded joint, is one of the difficulties that had to be combatted with ordinary electrodes at high currents.

Fig. 6 shows fillet welds made in the flat position with Ph. 55-7 (No. 59) and with Contact 15-5 (No. 76), both with alternating current, 375 amp, 30 and 375 amp, 42 respectively. The undercut can clearly be seen in No. 59 (under the 9 for instance). Fig. 7 shows two cross-sections taken from these welds; with Contact 15-5 (No. 1) the root penetration is about 1/16 in. deeper than with Ph. 55-7 (No. 2).

To sum up, it may be stated that the shape of the penetration as found with the heavier contact electrodes offers important technical advantages compared with that obtained with ordinary coated electrodes.

Welding Speed

It has already been mentioned that the arc voltage of contact electrodes, especially those of 3/16 in. and heavier, is considerably higher than that of the corresponding ordinary electrodes. In the course of the investigation it was also found that the heat efficiency of the contact electrodes, that is, the ratio of heat expended in the fusing of the metal to the total amount of heat supplied, is higher. This is due to a deeper cup enveloping a larger part of the arc than is the case with ordinary electrodes used with the free arc. The heat in the arc is thus used to greater advantage and the radiation of the arc into space is diminished. As a result of the two facts mentioned, the welding speed, that is, the amount of metal deposited per second, is considerably higher with the contact electrodes.

Averaged over a large number of tests it was found, for example, that Contact Rod 15-5² is about 50 pct

² The electrode numbers mentioned, Contact 15-5 and Ph. 55-7, are those of the N. V. Philips Co., Eindhoven, Holland.—Ed.

faster than Ph. 55-7². These diameters of the two types are particularly suitable for comparison because

FIG. 4—In these cross-sections of fillet welds made in the flat position, it can be seen that the depth of penetration depends on the current. Current at (1) was 375 amp, at (2) 300 amp, and at (3) 440 amp.

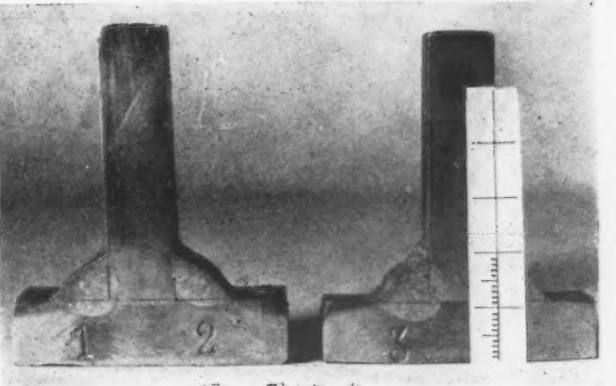
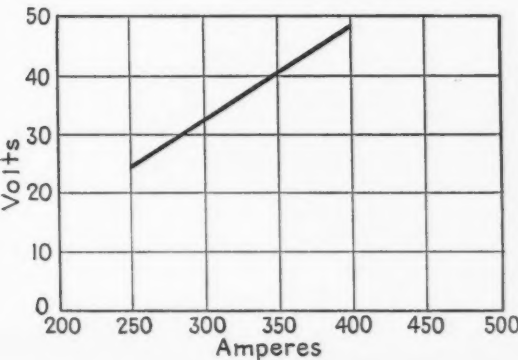
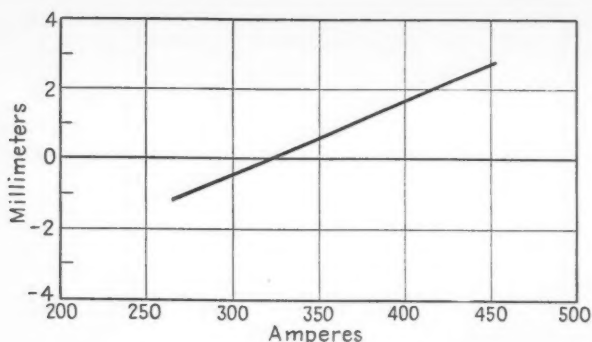


FIG. 3—Relationship between arc voltage and current for the Contact Rod. 15-5 electrode.

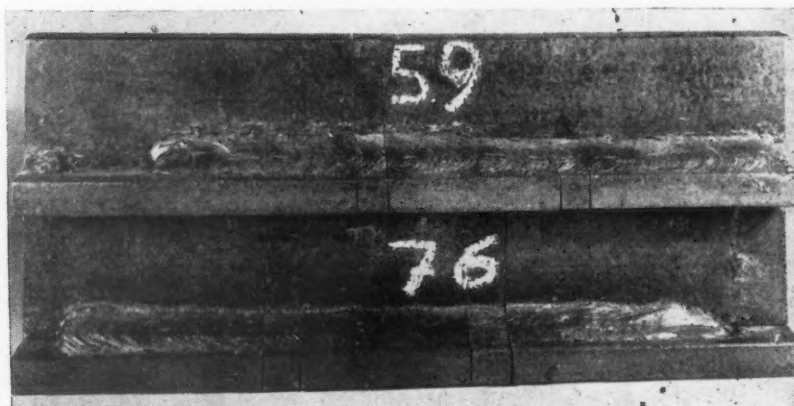




ABOVE
FIG. 5 — Relationship between root penetration and current used with Contact Rod 15-5, as established from the specimens shown in fig. 4.

o o o

RIGHT
FIG. 6—Fillet welds made in the flat position with Ph. 55-7 (No. 59) and with Contact Rod 15-5 (No. 76). In No. 59 the undercut can be seen under the figure 9, while No. 76 shows no faults at all.



they contain equal amounts of iron and slag-forming substances, and because, incidentally, the maximum current is the same in both cases, about 375 amp.

In addition to this greater speed of Contact 15 compared with ordinary coated Ph. 55 of the same weight, there is also the possibility, already mentioned in the discussion of the shape of the penetration, of using a heavier Contact 15 in many cases where a lighter type of an ordinary coated electrode would be required. This also means greater welding speed, since with a heavier electrode more iron is deposited per second. Therefore, in such cases this gain in speed must be added to the above 50 pct.

The distortion or warping of a weld may have unpleasant results in all welded structures and the avoidance of this demands much care and expert knowledge. It is, therefore, of great importance to note that in welding with contact electrodes there is little distortion. This fact is very closely connected with the high welding speed and the favorable shape of the penetration of these electrodes. It is known that distortion increases as the welding speed decreases and also increases with the number of layers in the weld. It has already been explained that in welding with contact electrodes, due to the special shape of the penetration, fewer layers are needed than in the case of ordinary electrodes.

In many cases, and especially with the lighter electrodes, the highest permissible current is determined by the fact that when using up the last piece of the electrode the top end becomes red hot, and this is apt

to cause the rod to bend. Since the cores of contact electrodes are much thinner than those of the corresponding ordinary electrodes, it might, therefore, be expected that the highest permissible current for contact electrodes would be much lower than that for ordinary ones, but actually there is not such a great difference. Due to the fact that the coating of the contact electrodes is heavy and conductive, it dissipates the heat much better than the coating of the ordinary electrodes, thus compensating for a large part the effect of the smaller thickness of the core wire of the

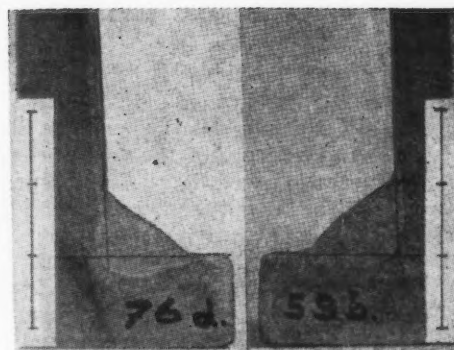


FIG. 7—Cross-sections of the welds shown in fig. 6. The weld made with Contact Rod 15-5 (left) shows root penetration about 1/16 in. deeper than with an ordinary electrode (right).

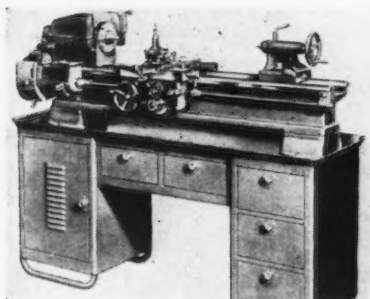
contact electrodes. Whereas with ordinary electrodes it is of only secondary importance whether or not the coating makes good contact with the holder, in the case of contact electrodes it is of great importance that the coating should make good contact with the holder, because otherwise the upper end of the core wire would become red hot much sooner than in the case of an ordinary electrode. The holder should have a reasonably high heat capacity and conductivity; the heads of holders specially made for contact electrodes are of copper and constructed in such a way as to fulfill this requirement.

New Equipment...

Developments in precision lathes, two-motor buffing and polishing machines, vapor-spray metal parts degreasers, fatigue tester, hydrogen electric furnace, variable-speed drive motors, and small pumps are discussed herein, together with various small tools, a sintered alloy, and expanded metals in aluminum and stainless steel.

Precision Lathe

AN addition to the S-56 series of lathes, the TRB S-56, which features Zero Precision tapered roller bearings, has been announced by *Sheldon Machine Co., Inc.*, 4258 N. Knox Ave., Chicago 41. Accuracy of these Timken bearings is said to be measured from 0.00 to 0.000015 in. To accommodate these bearings, the headstock of the lathe has been redesigned, eliminating bearing caps and changing to a larger, solid housing. Swing is 11¼ in. with a 1-in. collet capacity and 1⅜ in. hole through the spin-

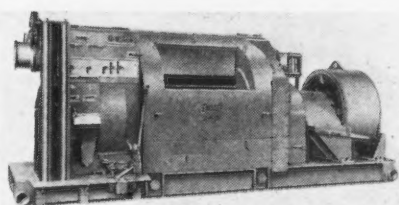


dle. The lathe is furnished on a heavy ribbed metal cabinet which houses a 4-speed V-belt underneath drive with double V belts to spindle. The bed is 56 in. long and measures 35 in. between centers.

Drilling Rig

DESIGNED and constructed for drilling depths in excess of 20,000 ft, a drilling rig, known as the J-2000 has been announced by *Emsco Derrick & Equipment Co.*, Los Angeles. Incorporating all proven, basic features of the company's J series drilling rigs, the J-2000 is a 200 hp unit which may be powered by either internal combustion engines, steam engines, or electric motors. With the combustion engines a selective transmission is used, engines being compounded through a compounding

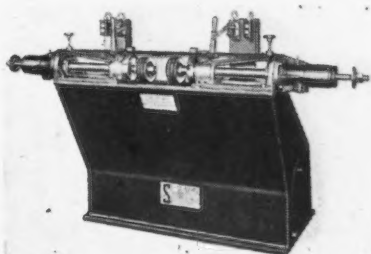
transmission driving slush pumps, draw works and rotary machine. The J-2000 draw works has direct air-operated clutches on all drum



and rotary drives. All controls are arranged at the driller's position. A jaw clutch engages a 40-in. double hydromatic brake or a 60 in. dynamatic electric brake.

Buffing and Polishing Machine

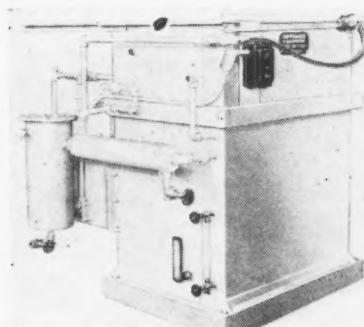
ANNOUNCEMENT of a two-motor Proper Speed buffing and polishing machine with overhang base construction has been made by the *Standard Electrical Tool Co.*, 2505 River Rd., Cincinnati 4. Each side of the machine is independent of the other, having its own motor, starting equipment, multiple V-belt drive, shaft lock, etc. Optional equipment is a hand brake for stopping the spindle or for stopping the spindle and shut-



ting off the current. The machine is available in sizes to include 2, 3, 5, 7½, 10, 15 and 20 hp motors. Spindle speed is selective and Speedial control is available on each spindle to provide an infinite speed range between 1500 and 3000 rpm.

Vapor Degreaser

AVAPOR-SPRAY type metal parts degreaser has been introduced by *Optimus Equipment Co.*, 95 Water St., Matawan, N. J. Known as Type OP-1-48, this degreaser is designed for use with trichlorethylene, with consideration given for solvent conservation, it is said. The unit is fabricated of 3/16-in. steel plate and reinforced by structural members and all electrically welded. The unit acts as a still to recover the contaminated solvent, thereby provid-



ing a continuous supply of pure distilled solvent for the spray as well as for the vapor phase. Chips and insoluble impurities and buffing compounds can be removed by the use of a spray of the solvent directed at the work. Heat to vaporize the solvent may be supplied by either steam, gas or electricity. Work clearance of this degreaser is 45 in. long x 27 in. wide. The unit has a capacity for handling 200 lb of steel per hr.

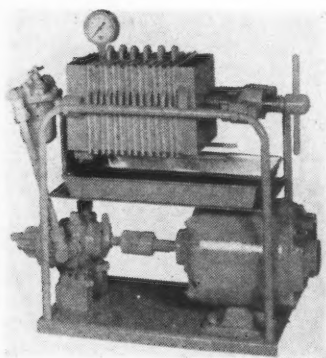
Cleaning Agent

DESCRIBED as a free-flowing blend of mild alkaline materials and water-softening ingredients in powder form, Optimus No. 100, a new industrial cleaner announced by *Optimus Detergents Co.*, 92 Water St., Matawan, N. J.,

is said to be completely soluble in hot or cold water. One application for the new product is in power spray washing machines where it is claimed to be very effective in removing light oils, grease and dirt on metals. Good results are also claimed for electro-cleaning where a cleaner of highly stable electrical conductivity is desirable. Optimus No. 100A, a cleaner of the same composition but containing a wetting agent, is also available for soak-cleaning steel surfaces. Both are available in 100 and 400-lb containers.

Laboratory Filter Press

AVAILABLE to users of small filtration systems is a portable filter press made by *Buckeye Laboratories Corp.*, 6700 Morgan Ave., Cleveland 4. The press weighing

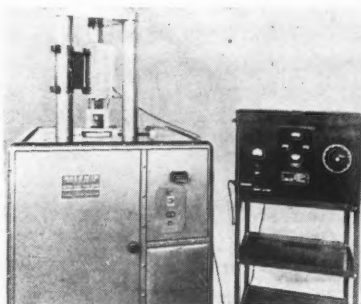


only 70 lb and measuring 18 in. high x 14 in. long x 8½ in. wide is said to be capable of high-efficiency filtration at the rate of 60 gph. Incoming fluid is passed through a Cuno filter which removes all colloidal particles 0.0035 in. or larger. A built-in relief valve maintains fluid pressure below 60 psi without interrupting the filtration process. The pump is driven by a 1/6 hp 1200 rpm motor suitable for operation on a 110 v, 60 cycle power supply.

Fatigue Machine

THE Sonntag model SF-4 fatigue machine equipped for tension-compression testing both at ambient and high temperatures has been announced by *Baldwin Locomotive Works*, Philadelphia 42. This unit embodies the principle of automatic maintenance of a constant load throughout the period of

test. The entire working mechanism is seismically suspended on soft tension springs which are said to absorb over 99 pct of the vibratory forces. Maximum capacity in either direction is 10,000 lb. Speed



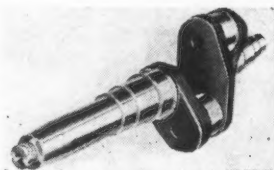
of testing is said to be 3600 load cycles per min and maximum movement of the reciprocating platen, ±1/16 in. Weight of the machine is 3000 lb and overall dimensions are 43 x 43 x 75 in. high.

Circuit Breaker

OUTSTANDING feature of a compact 225 amp frame industrial circuit breaker, announced by the *Square D Co.*, 6060 Rivard St., Detroit 11, is its small size, 10⅜ in. high x 6 in. wide. Another feature is the use of a solderless connector which facilitates the insertion of heavy cable by swinging open the hinged top of the lug, laying the cable into the lug, snapping the top into position and tightening the set screw. Trip ratings are 125 to 225 amp; voltages are 125-250 v dc-250 v ac, 600 v ac-250 v dc.

Balanced Crankshaft

DEVELOPMENT of a crankshaft, known as the *Equi-Balanced* crankshaft and said to eliminate air compressor vibration and increase compressor life has been announced by the *Davey Compressor Co.*, Kent, Ohio. The unit spreads compressor working strokes evenly over the 360° of crankshaft rotation. In 60 and 105 cfm V-type

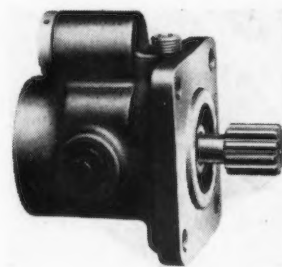


compressors, the design employs a two-throw crankshaft with throws spaced at an angle which is the

supplement of the V. In conventional 60° compressor cylinder arrangements, throws are spaced at 120°. The absence of rocking and vibration is said to make practical the employment of higher compressor operating speeds. *Equi-Balanced* crankshafts are now being employed on *Davey Air Chief* portable compressors.

Small Rotary Vane Pump

A SMALL lightweight pump having rotary vane-type mechanism has been announced by *Romec Pump Co.*, 108 Abbe Rd., Elyria, Ohio. The unit is a self-priming positive displacement pump designed for handling liquids such as fuels and lubricating oils up to No. 60 SAE oil. It will also handle glycerine, glycols, or non-corrosive fluids of a like viscosity. Maximum pressure is approx 60 psi for No. 100 SAE oil; 80 psi for No. 40 oil. Maximum output



is approx 70 gph for the No. 10 oil and 60 gph for the No. 40 oil. The pump is available with built-in by-pass and relief valves, also with various drive couplings and mounting flanges for engines and for electric motors.

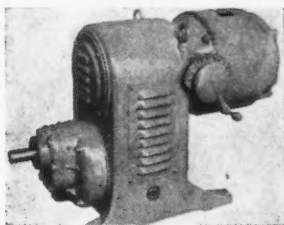
Hydrogen Electric Furnace

A HYDROGEN electric furnace designed for annealing and degasifying and for removing contaminating substances such as oxides and moisture from metallic material used in the manufacture of incandescent lamps, radio and electronic tubes, is being manufactured by the *Eisler Engineering Co., Inc.*, Newark 3, N. J. This hermetically sealed furnace is firebrick insulated and the heating element operating in a hydrogen atmosphere is a molybdenum wound alundum tube capable of withstanding temperatures as high as 3000°

F. The furnace is supplied with a tubular loading chamber and a jacketed water cooling unloading chamber. A flow gage connected with four drying towers for controlling and regulating the hydrogen gas flow is attached. The drying towers are charged with a chemical absorbent which eliminates moisture. The alundum heating tube is made in sizes from 1½ to 4 in. ID x 24 in. long. Power requirement for operation at 220 v, 60 cycle ac single phase, depends on the dimension of the heating element and is approximately 3 to 12 kw.

Variable-Speed Drive Motors

ADVANCED features of a series of variable-speed drive motors designated as Size 23, which have been announced by U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, include smaller size for a given hp, longer



belt life, more convenient positioning of the speed adjusting hand-wheel, and provision for easier change of Varibelts. Assemblies are available to fit a wide range of applications such as horizontal frame with shaft left or right, upright frame with shaft high or low, and built-in speed reducers of single or double reduction. Speed variations of 2:1 to 7:1 are obtainable with up to 5 hp output.

Master Switch

NEW design features of a mill type master switch announced by Square D Co., 4041 N. Richards St., Milwaukee 12, include a master switch handle position which covers 48° of travel from first point forward to first point reverse and offset handle construction available for grouping three or four units with only 7-in. handle centers. Hardened cam shaft has needle bearings and Bakelite cams are bolted in position. The star wheel

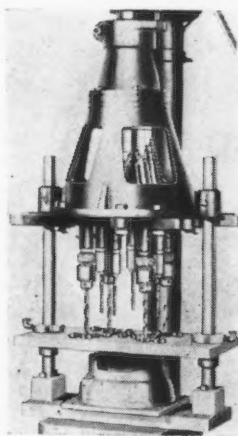
and roller are hardened steel and return spring pressure is adjustable. Movable silver contacts are



double-break type, spring closed, mechanically opened, and easily removed. Conduit entrances are 1¼ in.

Adjustable Drill Head

DESIGNED for machining parts of an electric motor, an adjustable spindle work head has been announced by the International Research Corp., 659 S. Anderson St., Los Angeles 23. The jig plate has 27 bushings; four spindles are provided with standard drill chucks and four spindles have collets to allow closer spacing of holes. With this arrangement, 10 different parts may be drilled, reamed, spot-faced or tapped at different setups. The workhead



may be attached to any standard drill press and the spindles may be adjusted to any desired pattern to suit production requirements.

Tool Holders

PRECISION floating holders developed by Barnaby Mfg. & Tool Co., 70 Knowlton St., Bridge-

port 8, Conn., are conventional in design and available in shank diameters of ⅝, ¾, 1, and 1¼ in. The cutting tool is held in the head of the holder, either directly or by means of a bushing, and is clamped by a hardened steel set screw. One hinged-shoe bushing blank is furnished with each floating holder.

Indexing Table

DESIGNED to support heavy workpieces without deflection, the Model 700 indexing table, manufactured by the Kaukana Machine Corp., Kaukana, Wis., for use with their series 125 portable horizontal drilling and tapping machines, has been adapted for use with other types of machine tools. It is also suited for inspection or layout work, it is said, because of its flexibility and rigidity. The



main bed is of heavy well-ribbed cast iron construction, with T slots provided in the top and at each end for clamping purposes, making it possible to hold work in either the horizontal or vertical plane. A 36-in. diam indexing platen, manually operated and which can be locked in any position, is in the center of the main bed. A hardened steel plunger and bushings assure positive indexing positions, it is said. Overall dimensions of the Model 700 are 72 in. long x 36¼ in. wide, and height of 29 in.

Revolving Stop

A REVOLVING stop for screw machines, incorporating a free turning live head has been introduced by the Boyar-Schultz Corp., 2110 Walnut St., Chicago 12. The tool is said to reduce friction between work and stop, preventing marring of piece parts, and due to its design and precision manufacture is said to help eliminate variation in piece-part lengths. The en-

closed ball race prevents entrance of chips and other matter. It is furnished in three sizes, 00, 0 and 2, and in 7 lengths.

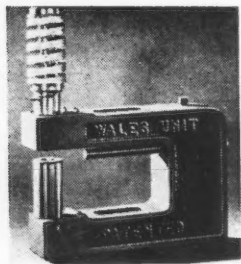
Step Collets

STEP collets for use with hydraulic chucks to hold extremely shallow pieces during multiple chucking operations on indexing machines have been developed by *Erickson Tools Div.*, 2309 Hamilton Ave., Cleveland 14.

These collets collapse over a range of 1/32 in., replacing seven standard single-purpose collets. They are designed for hydraulic or air operation, are said to grip uniformly along their entire length, permitting stubbing and the use of broken drills. They make possible increased speeds and feeds and lower setup time, and enable the manufacturer to guarantee an accuracy of 0.0005 in., it is reported.

Hole Punching Units

TYPE CJ heavy duty hole punching units designed to pierce mild steel up to 1/4 in. thick have been announced by *Wales-Strippit Corp.*, 345 Payne Ave., N. Tonawanda, N. Y. The units feature a pedestal die that permits punching angles and channels as



well as flat sheets, and it is claimed that the units may be assembled into a hole punching die for operating in stamping presses or press brakes. Each unit consists of a holder that carries the punch, die, and stripping mechanism. Units are available in three holder widths with max punch diam of 7/8 in.

Sintered Alloy

KNOWN as Mallory 1000 metal, a sintered alloy which has been prepared by powder metal-

lurgy methods and is said to be readily machinable has been developed by *P. R. Mallory & Co., Inc.*, 3029 E. Washington St., Indianapolis 6. The metal is said to have great strength and a high density approaching that of tungsten. It is resistant to atmospheric corrosion and to certain acids, making it useful as fixtures in electrolytic processes. Its high modulus of elasticity, ranging from 20,000 to 40,000 psi combined with its high density and tensile strength, are said to make it a suitable material for such highly stressed parts as balancing components, rotors for gyro-pilots and governors.

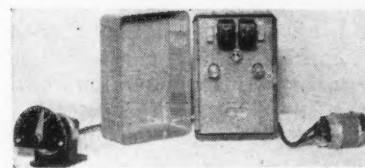
Expanded Metals

OPENING possibilities in the use of expanded metals exposed to moisture or corrosion, or where extra light weight is a factor, expanded metals in aluminum alloys and 18-8 stainless steel type 304 are available from *U. S. Gypsum Co.*, Chicago 6. Type 304 is available in 1/2, 3/4 and 1 1/2 in. openings made from 18, 16, 13 and 10 gage steel. The aluminum item comes in 0.051, 0.081 and 0.125-in. thicknesses and is also available in 1/2, 3/4 and 1 1/2-in. openings. Both are available in flattened expanded metal. Besides light weight, large percentage of open area, stiffness, attractive appearance, no rusting, high resistance to atmospheric and chemical corrosion are other advantages. The metals are suited for trays, baskets, grilles, conveyors, vents and similar applications.

Positioning Control System

DESIGNED for controlling inaccessible dampers from control stations on the floor, positioning heavy work in machine tools without hand labor, and opening, closing and adjusting to intermediate points valves and gates from a single co-ordinated control desk, an electronic positioning control system has been announced by the *General Electric Co.*, Schenectady 5. The system has three parts, a master control station, a follow-up device, and an electronic control panel. The driving motor can be any reversing ac or dc motor that can handle the load. The master control station may be placed in

any desired location. To operate, a dial is set and the motor moves the load to a new position corresponding to that of the dial. The system can be used on drives up to 1 1/2 hp



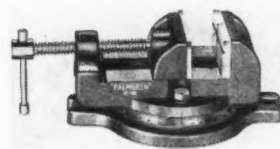
in general, and on many drives over this rating, after consideration of inertia of the load, speed, gear reducer arrangement, and accuracy or positioning needs.

5-Ton Dollies

DEVELOPMENT of the 5-Tonner Model Skid-Rol dollies with adjustable connecting bar for light loads has been announced by *Teichtmann Industries*, Milwaukee 1. This model dolly is 15 1/4 x 6 1/8 x 4 in. high with 3 5/8 in. diam solid steel rollers. The extension bar telescopes inside an iron pipe. Minimum span of a pair of dollies with extension bar is 36 in. overall, max 56 in. Frame is of structural steel, arcwelded, and the model is obtainable in pairs, or singly, with or without cleats and with or without extension bars.

Milling Machine Vise

A LOW-BUILT milling machine vise with a swivel base for accurate setups at any radius within 360°, has been marketed by *Chicago Tool & Engineering Co.*, 8383 S. Chicago Ave., Chicago 17.



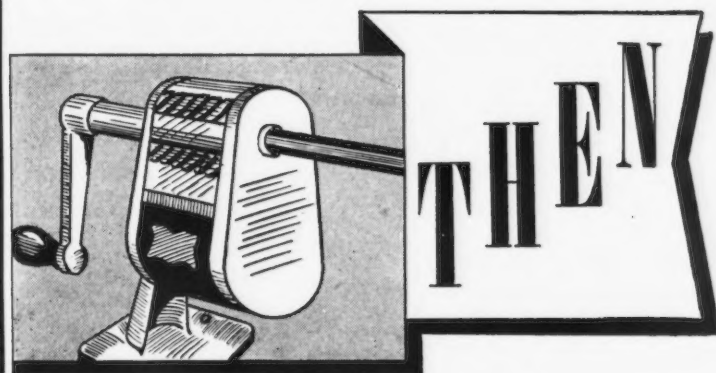
The vise has been designed to resist tool pressure and vibration. One jaw is grooved horizontally and the other vertically for holding round pieces. The swivel base locks and is graduated for the full 360°. Known as the No. 410, the vise has 4-in. jaws with a depth of 1 3/4 in. and a 4-in. opening. Overall height is 4 5/8 in. and weight is 21 lb.



**YOU'RE SEEKING UNIFORMITY OF HEAT
TRANSFER OVER LARGE SURFACES**

**AUTOMATIC—AND PRECISE—CONTROL
OF COMBUSTION IS PARAMOUNT**

**THE USE OF PROTECTIVE ATMOSPHERES
NECESSITATES INDIRECT FIRING**



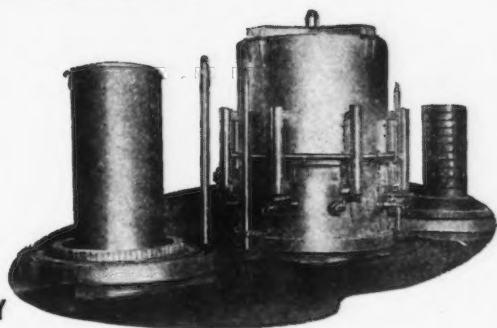
**select a furnace with
a KEMP firing system**

The best furnace builders use the best firing systems—because they know that *better control over combustion characteristics and heat transfer patterns makes for better control over heat treating results.*

KEMP firing systems hold top spot in the quality parade because: (1) KEMP carburetors can maintain gas-air ratios more accurately, more automatically and more reliably than other fuel mixing methods, (2) KEMP systems can operate at higher burner pressures (even above 3 psi, if you wish) to provide wider control ranges and higher furnace capacities, and (3) KEMP burners can be engineered to the shape, zoning, intensity and mode of heat transfer desired.

Building furnaces is *not* KEMP's business — but building their carburetion-and-combustion systems is KEMP's business. Make sure your next furnace installation is KEMP-fired.

KEMP-FIRED ANNEALER BY SWINDELL-DRESSLER



Normal charge—25 tons of strip in 3 stacks. Used for bright annealing. Extreme specifications on product cover: (1) finish, (2) grain size, and (3) ability to be deep-drawn. Loading space under inner cover—6'6" diam. by 8' high. Heated by *vertical* KEMP radiators (radiant tubes)—plus a single *horizontal* one. All radiators are *recirculating* for higher efficiencies and better temperature uniformities.



**PRECISION CARBURETION + ADAPTED COMBUSTION FOR INDUSTRY'S HEAT USING PROCESSES
ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL AND PROTECTION**

DEPT. K-E2 1a

The C. M. Kemp Mfg. Co.
405 E. Oliver St., Baltimore 2, Md.
Send me literature on your Series-S carburetors
and firing systems.

NAME _____

POSITION _____

COMPANY _____

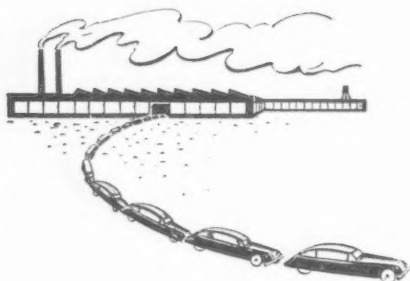
PLACE _____

Our furnaces are built by _____

Assembly Line

WALTER G. PATTON

• GM "docks" nearly 500 union members who attended the recent "Defend Labor" rally in Detroit . . . Four out of five specify Olds Hydramatic . . . K-F hits record output.



DETROIT—The "Defend Labor" rally held on Apr. 24 in Cadillac Square, Detroit, has cost the UAW-CIO treasury a minimum of \$15,000 in cold cash without changing a single Congressman's vote.

Back of the recent UAW-CIO action to pay its suspended members \$15,000 for lost time lies GM's firm insistence that the union live up to the letter of its contract even though the union leadership had voted to ignore the contract. Whether the union liked it or not, it did accept with good grace full responsibility for the acts of its members who were, after all, only following instructions received from the International Union when they left their posts to attend the Cadillac Square meeting.

The facts in the case are that the executive board of the International Union, UAW-CIO directed its members to leave their work on Apr. 24, to attend a labor mass meeting in downtown Detroit. Purpose of the rally was to demonstrate against proposed legislation under discussion in Congress.

Employees were told to leave their jobs at 2 p.m. on the first shift and not to report to work until 7 p.m. on the second shift. In the event that GM decided to discipline workers for leaving their

jobs, the union promised to back its members to the limit.

Most Detroit auto plants advised their workers through bulletin boards and posters that employees would be expected to remain on the job on the day of the rally. GM took a firmer stand at the outset and maintained its position throughout the controversy.

On three different occasions prior to the demonstration the corporation is reported to have notified the union that walkouts by workers would be interpreted as a violation of the agreement between GM and the workers' union. Local shop committees were also reminded that GM expected its workers to live up to the letter of the contract, any instructions from the executive board to the contrary notwithstanding.

On the day of the rally local union leaders in seven of GM's Detroit plants carried out the instructions received from the executive board. Approximately 13,000 GM workers are reported to have left their jobs on the first shift or to have failed to report for the second shift.

GM took 2 days to collect the evidence. Then things began to happen. A total of 15 union leaders were summarily fired and 26 others were given stiff lay-offs. A total of nearly 500 GM workers were eventually disciplined, including four presidents of local unions and six chairmen of shop committees.

As expected, the union protested vigorously against the disciplinary action. Negotiations continued with GM insisting on taking the case to the umpire if necessary.

THE final settlement was reached through negotiation but the only concessions made by GM were to rescind the discharges and reduce some of the lengthy layoffs.

Layoffs finally agreed upon affected the earnings of nearly 500 workers and ranged from 2 days to 2½ months. Plants affected included Detroit Transmission, Chevrolet Forge, Fisher Plant No. 27, Cadillac, GM Styling, Fisher Fleetwood and Chevrolet Gear and Axle. Longest suspensions were handed to John Mitchell and Frank Petril of Detroit Transmission and John W. Anderson of Fisher Fleetwood,

all top officials in their plant unions.

It is to the credit of the union that it accepted in writing full responsibility for the action of its members in leaving their jobs. The union further agreed that it will continue to recognize that work stoppages in GM plants "other than an authorized strike" are a violation of the GM agreement.

An interesting point of the negotiated agreement is that the present action is not to be considered as establishing a precedent. Some interpret this to mean that, if at some future time, GM decides to hand out even stiffer disciplinary action for breaches of its contract, the present agreement will not prejudice the situation.

The union has also agreed to withdraw all existing grievances and not to initiate any new grievances that might arise from this incident.

It is well known that Walter Reuther did not attend the rally although he had been a prominent speaker at a similar rally held about a year ago. When the present rally was held, Mr. Reuther was negotiating a new wage contract with GM.

Most observers here agree that Detroit is not likely to see another week-day labor rally for sometime to come. It is also pretty generally agreed that the GM action probably helped to establish a new high insofar as union responsibility is concerned.

THE GM Hydramatic first introduced in the 1940 Oldsmobile has now been ordered at extra cost by 320,000 Oldsmobile owners. Public acceptance has already reached a point where four out of five Oldsmobiles delivered today are equipped with Hydramatic drive. Hydramatic is also available on Cadillac and the ratio of owners who specify Hydramatic is even higher than 80 pct. As one Cadillac engineer expressed it, "Nowadays practically every new Cadillac excepting hearses and chauffeur-driven cars is Hydramatic equipped."

Despite wide acceptance there appears to be some misunderstanding among the motoring public as to the engineering advantages of the Hydramatic transmission. These advantages are in addition to

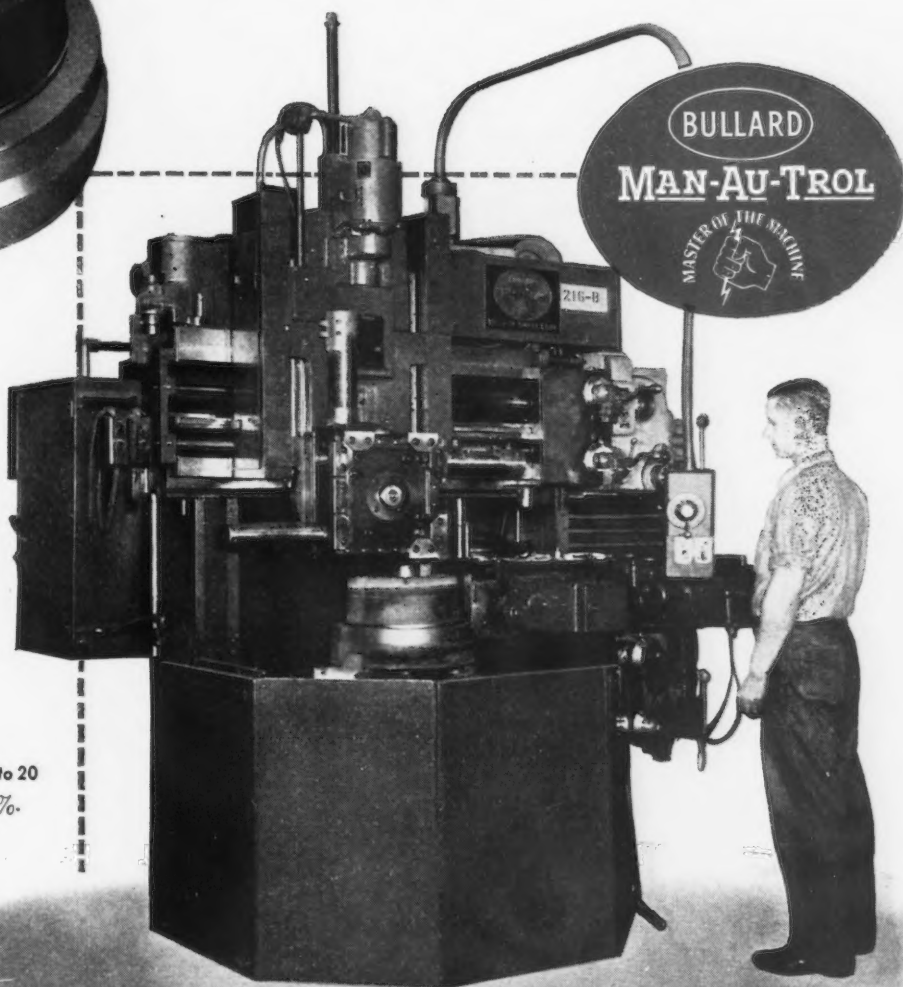
Leading manufacturer of construction equipment reports:

Cast Iron Drive Wheels Machined 5 Times Faster on a BULLARD Man-Au-Trol V.T.L.

No other machine offers such a cost-lowering combination of productivity, versatility and accuracy as a **BULLARD** Man-Au-Trol Vertical Turret Lathe. Bulletin MAV-G-1 tells you why. Write for your copy today. **THE BULLARD COMPANY**, Bridgeport 2, Connecticut.



Here are shown before and after shots of a cast iron drive wheel for a Motor Grader, machined on a 30" **BULLARD** Man-Au-Trol Vertical Turret Lathe by Austin-Western Company, Aurora, Illinois. The former method, employing two machines, took 1 9/10 hours. On the **BULLARD** Man-Au-Trol V.T.L., actual cutting time was reduced to 20 minutes... a time saving of 82.4%.



BULLARD CREATES NEW METHODS TO MAKE MACHINES DO MORE

THE IRON AGE, May 29, 1947—79

the 350 mechanical movements by the driver which Olds engineers have calculated are eliminated in a typical mile of city driving.

The facts are, of course, that the gear ratio of the Hydramatic has been selected to give even faster acceleration than the conventional transmission. An additional fourth gear permits engine speeds approximately 20 pct less than would be required using a conventional transmission. When maximum acceleration is desired, all the driver has to do is to press the accelerator down to the floor; this operation increases the power of acceleration approximately $1\frac{1}{2}$ times, according to Olds engineers.

Where the driver takes it easy, driving on ice is easily accomplished by the use of very gentle pressure on the accelerator, according to Olds owners. Skillful drivers say they have also learned to do an effective job of "rocking" to get the car out of holes although the change from forward to reverse cannot be made quite as rapidly as with the conventional transmission.

It is, of course, impossible to stall or kill the engine of a Hydramatic and this is a feature that is said to appeal to many drivers.

RECENTLY, Olds has announced the development of a new oil for the Hydramatic drive that re-

mains fluid at 40° below zero. Use of this new oil (plus recent mechanical improvements) is expected to practically eliminate cold weather starting difficulties in postwar Hydramatic drives. The new oil is also reported to reduce cold weather starting difficulties in prewar cars to a minimum.

Considerable engineering progress on Hydramatic drive was accomplished during the war when this transmission was used in many reconnaissance cars, tanks and other types of vehicle. Used in the coldest parts of the globe during the war, Olds engineers claim vehicles so equipped experienced no starting difficulties beyond those normally encountered by other vehicles.

The advantages of Hydramatic Drive are, of course, thoroughly explained in the drivers' manual. One buyer of a Cadillac who recently took delivery in Detroit wrote the president of the company to thank him for the courtesy extended by a plant employee who took the necessary time to give the new car owner a detailed explanation of Hydramatic and the special features it offers the driver. "I've bought a good many cars," the new owner wrote, "but this is the first time I have had a first-hand opportunity to learn about the features of my new car." The new car buyer was

most appreciative—as most new car owners are likely to be when they receive the same considerate treatment.

Kaiser-Frazer established a new high average production rate of 447 cars manufactured daily during the past week. High K-F output for a single day was May 16 when 469 new cars were assembled at Willow Run.

Reading these figures this week, many Detroiters were reminded that just a year ago this month, K-F produced its first handmade model. Since that time, 44,051 Kaisers and Frazers have been built, according to company officials.

Offers \$40 Million Plant

Chicago

• • • Formerly operated by Studebaker Corp., South Bend, Ind., the \$40 million surplus war plant which was used for the manufacture of airplane parts and engines is being offered for sale or lease on a competitive bid basis by WAA. The property comprises an area of 312 acres and includes a manufacturing building with a floor space of 1,062,000 sq ft. Total floor area, including the auxiliary buildings, amounts to 1,500,000 sq ft.

Truck Registration High

Detroit

• • • R. L. Polk & Co. statisticians predicted that new truck registrations for March may surpass all previous records.

Based on reports from 15 states a total of 97,000 new trucks may be registered during the month, compared with a previous high mark of 74,708 units established in October 1946.

Total trucks registered during the first quarter may approximate 223,000 units also a new record, the agency said.

Estimated new passenger car registrations for March approximate 300,000 units based on tabulations from 20 states, where a total of 59,015 new cars was registered.

Polk statisticians estimate that more than 650,000 new cars will be registered during the first quarter when all returns are tabulated. Last year the 500,000 mark was not passed until 6 months had elapsed.

STILL TOUGH TO GET: *There will be about 400 less buyers screaming for new cars when this shipment finishes its journey down the Ohio River to southern states. Part of it is shown here, towboat in the background, after an overland trip from Cincinnati.*



ORNAMENTATION OF METALS

Etched zinc name plate with three-color enamel fill-in. Blanked pierced and formed.



PLASTIC AND METAL COMBINATIONS

Highly decorated center button of clear plastic, set into plastic container with decorated chrome metal strips.



*Under one big roof
at AUTO-LITE*



The versatility of plastics, metals and plastic-metal combinations has opened unlimited possibility for the modern designer who is striving for precision and eye-catching appeal at the least possible cost.



Under one big roof at Auto-Lite's Bay Manufacturing Division are the technical skills and the equipment which provide decorative and functional developments in both plastics and metals . . . These have proved themselves essential ingredients in the development and improvement of a wide variety of manufactured products.

THE ELECTRIC AUTO-LITE COMPANY

Bay Manufacturing Division

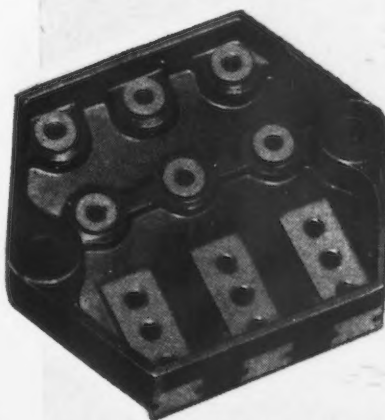
Detroit 2, Michigan

Bay City, Michigan

Tune in the Auto-Lite Radio Show Starring
Dick Haymes—Thursday Nights, 9:00 P.M.
—E.T. on Columbia Broadcasting System

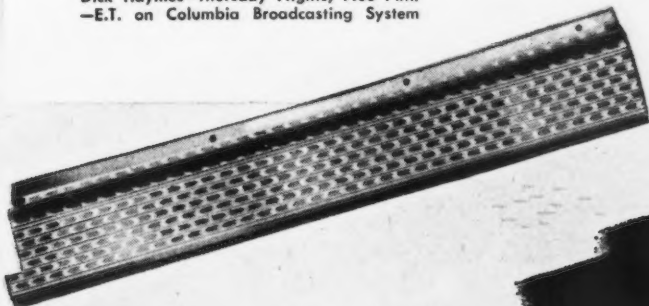
ORNAMENTAL PLASTICS

Clear plastic crest of three-dimensional casting, decorated enamel fill-in.



FUNCTIONAL PLASTICS

Plug-in thermo-setting plastic terminal with intricate metal inserts.



ROLLED AND FORMED METALS

Etched and polished aluminum scuff plate with enamel fill-in. Rolled, formed, pierced and trimmed.

Auto-Lite

• **FTC crusade to control sales of physical assets slowed down . . . Admits no pressure by steel firms in acquiring drum plants.**



WASHINGTON — Little success has attended the Federal Trade Commission's latest renewal of its drive for a new weapon to use in the crusade against what it termed "concentration" of "big business." This weapon is an amendment to the Clayton Act as proposed under the O'Mahoney-Kefauver bills.

More specifically, what the FTC wants is to obtain the same power to pass on proposed sales of the physical assets of corporations that it is now authorized to wield over disposition of stock. Under Section 7 of the act, within certain limits, the FTC can block the sale or force the divestiture of stock where it has determined that such acquisitions constitute a monopoly or result in a reduced competitive status in that particular field.

The courts have ruled that the Commission's present power under the act is clearly limited to supervision of stock transactions and does not apply in cases where the purchaser of assets alone are involved. The crux of the matter is the FTC contention that the ruling leaves a loophole in the act whereby the way is left open to big, bad business—should it so choose to do—to buy up the physical assets of a competitor, dispose

of them by transfer or otherwise, thereby leaving the holders of the stock also holding the bag. Likewise, it is contended, such a move also disposes of a competitor and tightens the monopoly in the industry concerned.

Historically, a bill to accomplish the end sought by the FTC was drawn up by the Commission and introduced in the 79th Congress by Senator O'Mahoney, D., Wyo., and Representative Kefauver, D., Tenn. Lengthy hearings were held by the House Judiciary Committee which, after some amending, reported the proposal favorably. However, the House Rules Committee never sent it to the floor of the House and it died with the last Congress.

Reintroduced early in the present session, the O'Mahoney-Kefauver bills have been taken up by a Senate Judiciary Subcommittee headed by Senator Langer, R., N. D. However, at present it is traveling a rocky and stormy road and is conceded no chance of passage this year. Indications are that the Senate group will move slowly in making recommendation of any sort.

IT started off by looking into the steel drum manufacturing field—an industry which the FTC holds is a particularly flagrant example of not only economic "concentration" but illustrative of the need for amendment of the Clayton Act. Seven steel companies, declares the FTC, have acquired ownership or control of more than 87 pct of the steel drum fab-

See p. 114 for drum output data.

rication industry. Furthermore, Commission representatives said, two companies own 100 pct of drum fabricating facilities on the West Coast while three firms own 95 pct on the East Coast.

Commission witnesses, however, admitted that there was no indication of collusion or apportioning of territory among the steel companies. Nor, they testified, was there any evidence that any kind

of pressure had been brought to bear upon those who sold out to the steel companies—that in so far as could be determined, all were operating at a profit and apparently just wanted to sell.

Witnesses for the steel companies testified that the initial approach in the transactions had been made by the fabricators and that the purchases, for the most part, had been made only after protracted negotiations. Charges were denied by steel officials that restrictive causes were placed in the sales contracts prohibiting the seller from engaging further in drum fabricating.

At present, the subcommittee shows evidence of leaning towards the view that perhaps government regulations and fiscal policies may have as much to do with squeezing the smaller corporations out of existence as any other factor. All indications are that the group would like to delve a little deeper into the matter and find out to its own satisfaction to what extent the government's present policies may affect or operate to restrict the activities of the little businessman—a rather new and startling attitude on the part of a government which for the past 15 years has held that only governmental remedies will solve the economic problems.

"SOMETIMES we say to ourselves let's pass a law to correct this situation without ever going into the subject deeply enough to know just what it is we're trying to do," observed Senator Ferguson, R., Mich., who presided over the opening of the hearings. "I would rather get at the underlying cause and correct it than to just offer prohibitive statutes which may or may not solve the problem."

Curiously enough, the very industry picked by the FTC to prove its contention that more regulation is needed also has worked to emphasize the extraordinary amount of power which enactment

Right: **CHANGING FEEDS.** It's easy on the 2 ML—half turn of a crank selects next higher or lower increment.

Below: **STARTING LEVER** on 2 ML, adjustable to either side of machine for maximum convenience.

Left: **RESETTING MICROMETER DIALS** the 2 ML way. Just pull out dial against light spring pressure, rotate it to setting desired.

Below: **ENGAGING POWER RAPID TRAVERSE** to the table. 150 inches per minute table and cross; 75 vertical.

WHY YOU SHOULD
SELECT A MACHINE

THAT'S
**EASIER
TO OPERATE!**



Above: **CHANGING SPINDLE SPEEDS.** Simply rotate a single crank type control, white by-drawings do the work of shifting gears. Drawings at the right tell how.

A single lever selects all speeds. In the example shown one half turn to the right changed spindle speeds from 225 to the next higher speed, 295 r.p.m.

In this example one half turn to the left of the single speed dial lever changed spindle speed from 225 to the next lower speed, 168 r.p.m.

Convenient location of independent and directional power feed controls: A—Table feed lever. B—Cross feed lever. C—Vertical feed lever. D—Rapid traverse lever.

● It's evident why shopmen like a machine that's easy to set up and operate. Perhaps not so evident, but nevertheless it's true, "ease of operation" reflects through an entire organization, from the man at the machine to the yearly financial statement. There are fewer rejects; percentage of labor turnover shrinks; accidents decrease. That's why special attention has been paid to convenience and ease of operation and setup for the new CINCINNATI No. 2 ML Milling Machine.

These illustrations show how this has been accomplished. ¶The 2 ML, companion machine to the CINCINNATI No. 2 ML, has many other advantages. It's safe to operate; stays accurate for years; maintenance cost is low. Powered by a 3 h.p. motor and built in Plain and Universal styles, the versatile No. 2 ML is ideal for a wide variety of milling operations in shops of all kinds; for vocational schools; for seagoing machine shops. Cat. M-1507-1 contains complete engineering data.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES

• BROACHING MACHINES

• CUTTER SHARPENING MACHINES

of the proposed amendment to the Clayton Act would vest in a government agency — virtually the power of life and death over enterprises to which it would be applicable.

As it now stands, such amendment to the Clayton Act would, in effect, merely liberate a smaller corporation from the "danger" of being gobbled up by a larger competitor only to place in the hands of a government bureau the absolute power to decide whether any corporate sale should be consummated.

ADMITTING probability of the existence of monopolies in some industries, the Subcommittee has raised the question of what good purpose would be served by such regimentation. Suppose, it was asked, that a firm (to which the statute applied) wished to go out of business for any reason whatsoever but could obtain offers only from competitors? Could not a refusal of FTC to approve such a transaction conceivably result in the forced closing or scrapping of the business? And would not such a disposal bring about the very condition which the Com-

mission seeks to prevent—lessened competition by eliminating one of the competitors from the field?

The position of the FTC, as indicated at the hearing, was that perhaps the elimination of a business might be better than to allow another to acquire more facilities. Surely, the FTC representatives held, somewhere there could be found someone interested in acquisition of a business other than a competitor.

When pressed for more definite answer to the Subcommittee's line of inquiry, a witness admitted that should such a contingency arise the Commission would "probably" stand firm in a refusal to sanction a sale to a competitor if it had decided that the acquisition would result in "probable lessening" of competition—even though no other buyer could be found. Prevention of monopolies in the "public interest" must be considered first, it was contended.

Witnesses have offered no definite yardstick by which the FTC would measure "probable lessening" of competition, stating that this would depend upon a number of factors. Nor could they offer

any estimate as to the probable cost of administering the amendment—an important factor in view of the current high interest in appropriations, as one committee member commented.

Still unconvinced as to the desirability of the amendment after several hours of testimony, the Subcommittee has recessed until some as yet undetermined date.

INDUSTRIAL mobilization planners who are currently exploring potentialities of taking war plants underground in the event of an emergency are closely studying foreign manufacturing experiences in World War II. Of special interest has been material turned up by the Army Air Forces which indicates that, contrary to belief in some quarters, the Japanese were making considerable headway in this direction when the war ended.

Not only this but in some instances the Japanese were not far behind the Germans. A typical example is offered in the measures taken to hide the Nakajima Aircraft works in the Oya area from the raiding American B-29's. This particular dispersal work began in 1945.

The Otome plant for fabrication of sheet metal parts was put into an underground installation consisting of 12 parallel tunnels driven through a hill so as to leave both ends open; in general, this plant was built along the lines of German plans for horizontal type plants.

Wide use was made of stone quarries for dispersal sites, utilizing fully those in close proximity to each other and which varied in area from a few thousand to nearly 100,000 sq ft. Entrance was gained by vertical shafts or inclined ramps, apparently depending on geographic location. An outstanding feature was the network of tunnels connecting the factories.

One particular bad feature has been emphasized by study of the Nipponese underground plants. An excessive amount of corrosion of machine tools and machine parts because of the high humidity was found to have existed. It is believed, however, that this may be largely overcome by efficient airconditioning since the Japanese ventilation was accomplished only through crude fan installations.

THE BULL OF THE WOODS

BY J. R. WILLIAMS

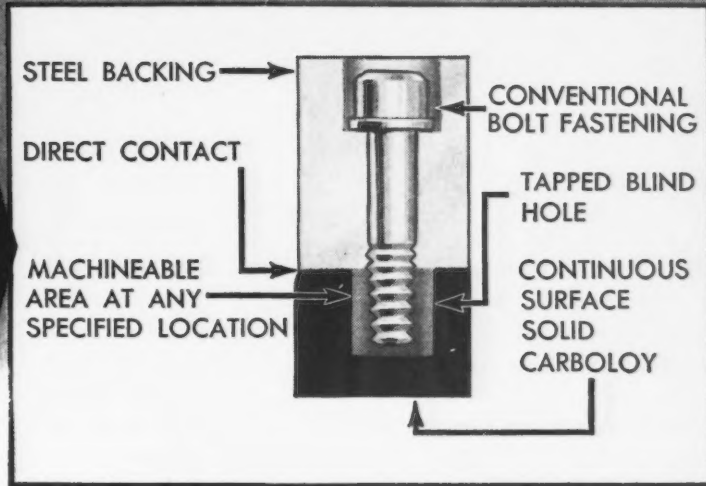


NOW!

WHEREVER YOU NEED IT

WITH BOLTS!

ATTACH CARBOLOY*

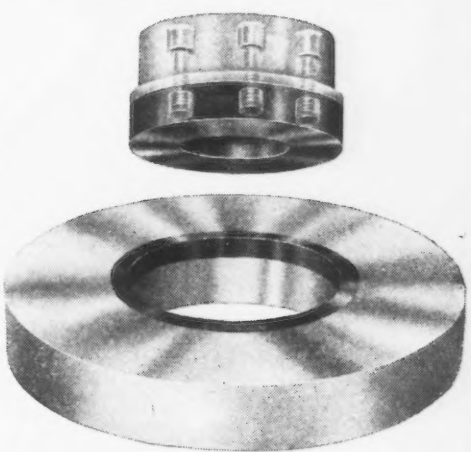


New Mounting Method Provides Interrupted Carboloy Surfaces Bolting to Tapped Blind-Holes

—exclusive . . . this Carboloy-developed mounting method tremendously widens cemented carbide's range of usefulness!

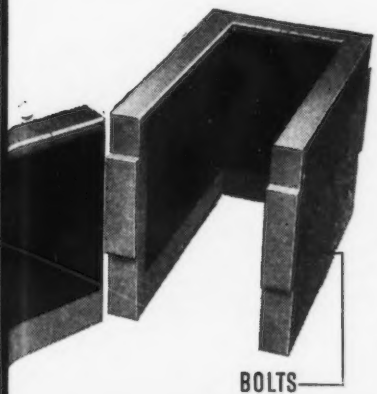
Carboloy Cemented Carbide sections are supplied to your specifications, already equipped with machineable inserts which may be drilled and tapped for bolting into place. Very large sections of carbide can now be easily mounted where needed. By blind-tapping, "through holes" are eliminated, giving continuous uninterrupted surfaces.

CARBOLOY PUNCH AND DIE SET shown here illustrates how studs are used to attach carbide to mounting. This gives a solid steel backing for the carbide punch, greatly increasing its ability to resist shock.



Direct contact of carbide with back-up metal increases impact resistance. Users can specify desired locations of attachment points, and drill and tap inserts in their own shop.

Typical of the range of applications are: Wear parts on fixtures, machine ways, guides, work rests and shoes, compound, progressive and segmental dies, crank guides, cam liners, punches, wear plates, and many others. For further details, write: Carboloy Company, Inc., 11153 E. 8 Mile Ave., Detroit 32, Michigan.



TYPICAL WEAR APPLICATION shown here illustrates how the new method makes possible attaching large sections of wear-resistant Carboloy without use of "through-holes" thereby obtaining a continuous uninterrupted surface. Carboloy section shown here measures 6 3/8" x 9 1/2".

BOLTS

CARBOLOY CO. INC.

11153 E. Eight Mile Ave.

Detroit 32, Mich.

* **CARBOLOY** CEMENTED CARBIDE
(TRADEMARK)
SHEET METAL DRAWING AND BLANKING DIES

• Fate of Kaiser Co., Inc., steel plant at Fontana has all the elements of melodrama . . . Continued production of 25 pct of U. S. copper insured for 60 days in face of labor dispute.



SAN FRANCISCO — All the drama—and melodrama—of a western thriller is developing as a result of Henry J. Kaiser's proposal to the RFC that the original loan on Kaiser Co., Inc.'s steel plant at Fontana be slashed approximately 79 pct.

The mustachioed villain is, of course, the RFC; the Kaiser interests are the proud parents of the Fontana baby which faces a dark and uncertain future if the villain forecloses; and the hero is easily recognizable as the steel committee of the Western States Council which is fighting to preserve the old homestead.

Nothing is lacking in the presentation of the drama. The catcalls and cheers of the audience made up of a large segment of American industry round out the picture.

As pointed out in the *THE IRON AGE* of May 15, 1947, p. 76, this audience is well divided between those who believe the villain is well within his rights in demanding his

For Kaiser's proposal see p. 108.

pound of flesh and those who think that the hand of mercy might well be extended to protect the infant born in travail when industrial obstetricians came high.

Of course, there are some of the more cynical in the audience who are inclined to believe that the hero

is not entirely altruistic and is putting his weight in the fight for ulterior motives.

Perhaps the most impassive members of the audiences—at least outwardly—are those with well-matured offspring in Los Angeles, Pittsburg, Calif., Torrance, Calif., San Francisco and Geneva, Utah. They may well fall into the roles of drama critics who are saving their best lines for use after the final curtain.

Among those who believe that the RFC should be paid in full or the Fontana baby put out in the raging storm of open, competitive bidding is a retired independent fabricator of this area who stated:

"The interests who are espousing Henry J. Kaiser's cause today are the same interests who prior to World War II for some 30 years, flooded this market in the State of California with foreign steel and used the differential in price to break down the price of the domestic product, thereby being the means of causing destructive competition in many lines. And now these same interests, not being able to buy foreign steel, want Henry J. Kaiser to survive in order to receive the advantages of his destructive competition.

"Henry J. Kaiser should have no more consideration than was shown the little fellow, who did not bring any foreign steel into this market, but nevertheless was forced out of business by just such inequalities of free enterprise."

Red herrings across the trail to throw off pursuing bloodhounds or befuddle aid which might be inclined to rally to the defense of the threatened Fontana family are in evidence.

Senator Styles Bridges, (R, N. H.) tossed out a few of these fish in his speech before the Senate last week, but they were immediately picked up the worse for wear and handed back to Mr. Kaiser.

IMPLICATIONS by the Senator that there was a close relationship between the alleged poor showing of the Kaiser-Frazer Corp. and the request for write-down on the RFC Fontana loan were answered by Mr. Kaiser:

"Simple honesty and a public

servant's supposed concern for the welfare of many thousands of little people should have prompted Senator Bridges to check his facts. They are, as has happened in the past with the gentleman from New Hampshire, strictly at complete variance with reality. Had he sought the truth he would have discovered the following:

"(1)—Kaiser-Frazer is now operating successfully and is contributing to the welfare of its 30,000 stockholders, 4000 dealers and 9000 employees. The company has produced 45,936 automobiles in the last eight months. (2)—The West's independent steel mill at Fontana is entirely separate and apart from the Kaiser-Frazer Corp. (3)—Any idea of real estate speculation at Willow Run is utterly and completely false."

Seasoned playgoers who have watched similar industrial dramas take a pessimistic view over the future of the Fontana child although they have seen only the first act of the current production. They point out that the RFC now holding the mortgage is a tougher customer than the original and might welcome the opportunity to foreclose to show its power.

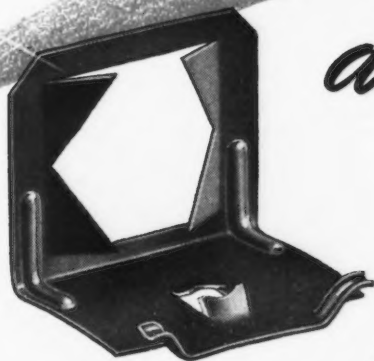
It is also appreciated that if foreclosure does occur, the victory for RFC will probably be a hollow one as the Fontana homestead would have to be put on the block and sold to the highest bidder, and that the bid would likely be in the Geneva and other DPC plant range of 20¢ on the dollar.

Sympathetic critics of the Kaiser move for reduction or write-off of the loan suggest this might be Mr. Kaiser's best chance to acquire clear title to the plant because of the improbability of the Dept. of Justice permitting any of the large steel companies to further expand in this area.

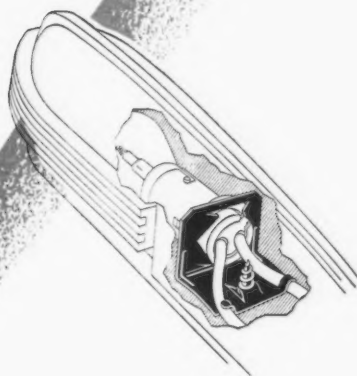
Whether Fontana faces "A Fate Worse than Death" will be determined only after the villain speaks his last line.

SALT LAKE CITY—Threatened shutdown of Kennecott Copper Corp.'s Utah operations, currently the source of about 25 pct of the domestic copper production, was averted a second time last week by government intervention in a dis-

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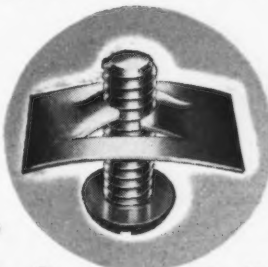
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F A S T E S T T H I N G

I N F A S T E N I N G S

THE IRON AGE, May 29, 1947—87

pute between the corporation and railroad brotherhood employees of the Bingham & Garfield railroad.

The strike was originally set for Mar. 24. A few hours before the walkout was to take place the National Railroad Mediation Board came through with an offer to mediate. This served to postpone strike action until mediation efforts collapsed. The walkout was then reset for May 21. But before the deadline, President Truman declared an emergency, thereby automatically staying the strike for at least 60 days—30 days for the fact-finding board to make its report plus a 30 day waiting period.

A strike on the railroad, which transports the ore from the open-pit mine at Bingham to the Magna-Arthur mills, would tie up the entire mining and milling operation as well as the American Smelting Co. smelter at Garfield, and idle more than 5000 workers.

The railroad workers are seeking a guarantee that they will retain their status as railroad employees after Kennecott completes its new industrial line from the mine to the mills. The corporation has taken the position that the law, not Kennecott, classifies the workmen and that inasmuch as the new line will not be a common carrier, the employees will automatically become industrial employees. The present Bingham & Garfield Railroad is a common carrier.

* * *

SEATTLE—Momentarily at least, labor peace reigned here after the 2-day walkout of approximately 10,000 workmen in the metals trade field.

Members of the ten unions involved returned to work early last week and the settlement effected was substantially that demanded by the union on the eve of the walkout.

However, Kenworth Motor Truck Corp. remains closed as a result of the walkout of Automotive Machinists Union, Local 289, which is demanding 15¢ an hr increase. Kirsten Pipe Co. is likewise closed down since this company did not accept the agreement reached by the other metal workers and employers last week. Management is requesting the creation of a production worker classification, contending that many jobs which do not require skill of a journeyman are being filled by men drawing journeymen's pay.

Negotiations between the Boeing Aircraft Co. and the Aeronautical Mechanics Union continue with no progress reported. Both sides apparently are remaining adamant on their offers and demands and there are no signs of weakening on either side. The main issues involved are an additional 5¢ an hr with the company offering an average of 10¢ and the union demanding a total of 15¢. Seniority and a staggered work week are also points of contention. Late last week indications were that the union would establish a deadline for a strike.

Another cloud appears on the labor horizon in the form of a threatened strike to be voted on May 31 by the machinists employed in the shipyards. I. A. Sandvigen has contended that the machinists in the shipyards are the lowest paid in the metalworking trades industry, even though they received an 18½¢ an hr increase a year ago.

Previous to these most recent labor upsets, the Office of Unemployment Compensation and Placement of the U. S. Bureau of Labor reported that total manufacturing employment in the State of Washington for the period from Mar. 15 to Apr. 15 showed an increase of 1300 with the major increases in lumber and timber basic products industry. However, even this increase was reduced somewhat below the normal upswing due to the uncertainty of marketing conditions and the reluctance to build up large inventories at high prices.

An increase of from 5900 to 6300 employees was recorded in the iron and steel group of industries where shipbuilding employment dropped 500.

PORTLAND, OREGON — Curtailment of production and the imminent closing of the Longview, Wash., plant of the Reynolds Metals Co. which, since 1941, has been producing aluminum ingots at the approximate rate of 60 million lb per year, has raised the question locally whether this portends the beginning of the end for the aluminum industry in this area.

The Reynolds plant has maintained a payroll of approximately \$30,000 weekly and because of its having been the first producer of aluminum ingots in this area, it has assumed a more than ordinary importance in the eyes of many.

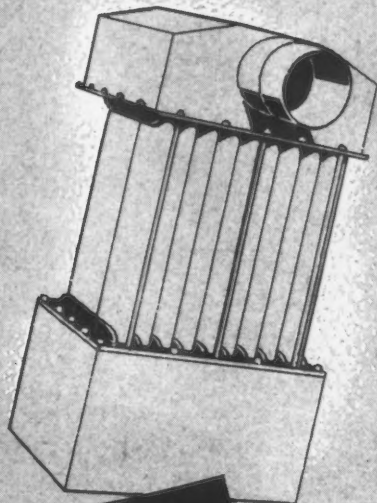
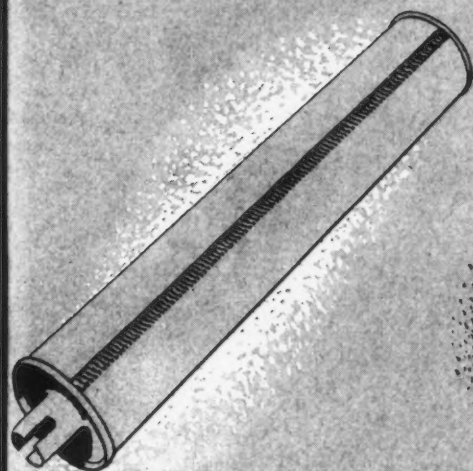
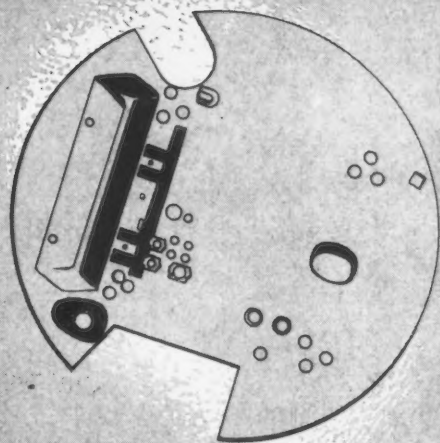
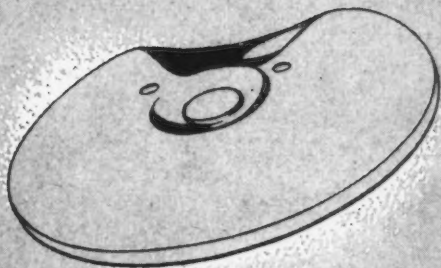
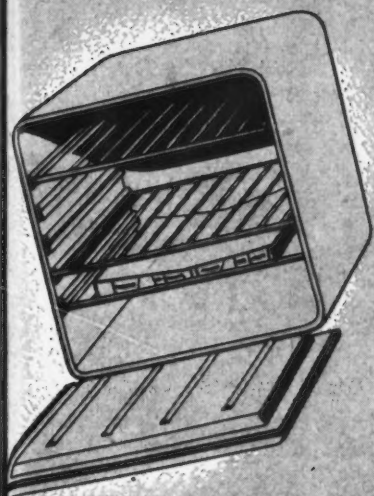
From best available information

the shutdown is necessitated by an over-supply of aluminum ingots in the stockpiles of the Reynolds Co. and since this plant does not have all the modern advantages of some of the newer potline producers in the Northwest, it seems logical to believe that it should be one of the first to shut down. Company officials indicate that during the shutdown period steps will be taken to modernize and remodel the potlines which had already been begun. Optimistic reports indicate that the plant will be put into operation within a year.

Other aluminum producers in the area give no evidence of reducing production and both the Aluminum Co. of America and The Permanente Metals Corp. plant in the Northwest are continuing at as near full production as availability of power will permit. When the Longview Reynolds plant is completely shut down, approximately 60,000 kw of Bonneville power would be released and this is so much in demand that the Bonneville Power Administration has waived the usually required six months notice of power severance.

Some concern has been evidenced over the industrial future of this area which seemed so brilliant for the past year. The closing of the Reynolds plant would release approximately 500 employees and the reduction in membership of the Structural Iron Workers Union indicates a shrinkage in heavy industrial production.

In a very frank analysis of the economic situation in the area, Sid Woodbury, president of the Portland Chamber of Commerce, recently expressed concern for the higher prices for manufactured goods necessitated because of high overhead, high interest costs, low productivity of labor and high wage scales. Mr. Woodbury mentioned such firms as the T & C Tool Co., Eastside Tool & Die Works, National Mfg. Co., Iron Fireman Mfg. Co., and Moore Dry Kiln Co. as having noted the effect of their higher wage rate and the handicaps of freight on steel from the East and transportation on finished goods back to the larger eastern markets. Hyster Co., one of Portland's largest manufacturers, is reported as working on a wage scale that averages 11¢ per hr higher than that in effect in their Peoria, Ill. plant and 29¢ per hr more than in their Danville, Ill. plant.



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European Letter . . .

JACK R. HIGHT

- American objectives vague to other powers . . . Is present policy fight on Communism or phase of imperialistic plan?



LONDON—In any comparison of the potential resources of the Great Powers, the United States, even before Hitler's war, far outstripped every other nation in the world in material strength, in scale of industrialization, in weight of resources, in standards of living, by every index of output and consumption.

And the war, which all but doubled the American national income while it either ruined or severely weakened every other Great Power, has enormously increased the scale upon which the United States now towers above its fellows. Like mice in the cage of an elephant, they follow with apprehension the movements of the mammoth. What chance would they stand if it were to begin to throw its weight about, they who are in some danger even if it only decides to sit down?

There is, indeed, one question that the analyst of power need not spend time in asking about the strength of the United States. If raw material resources, industrial capacity, scientific knowledge, productive "know-how," skilled labor—if these alone were the ingredients of power, then the United States could take on the rest of the world single-handed.

But though these things are essential ingredients, they are not all that it takes to make a Great Power. There must also be the

willingness, and the ability, to use economic resources in support of national policy. The rulers of Russia are not likely, at least for a generation to come, to have nearly as good cards in their hand as the Americans. But the nature of their system of concentrated power and iron censorship enables them to play a forcing game. The Americans' hand is all trumps; but will any of them ever be played? And for what purpose?

THERE is no lack of prophets, either in America or in Europe, anxious to tell the world that the United States either will or should turn to an aggressive imperialist role in world affairs. Critics on the Left argue that capitalism is inevitably aggressive and that sooner or later the largest capitalist community is therefore likely to prove the most aggressive. Supporters on the Right argue that America, as the last stronghold of the free-enterprise system, must use its strength to preserve this "free way of life."

Nor is it only in books and speeches of private citizens that the evidence of imperialist tendencies can be found by those who are in search of it. There are actions of the United States government that fit neatly into such a thesis. For example, in the name of defense, most of the islands in the Pacific Ocean have been brought

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under exclusive American control. And the appropriations for Greece and Turkey were presented to Congress as the first step in a worldwide policy of opposing Communism everywhere. Is this then a new phase in American policy, a phase of expansion and imperialism?

Only those whose view of America is distorted by ignorance or malice, or obscured by dogmatism, could possibly believe any such thesis. It is true that there are individual men and women and groups, some of them with a measure of influence, who are impressed with their country's overwhelming strength and attracted by the short cuts of aggressive diplomacy.

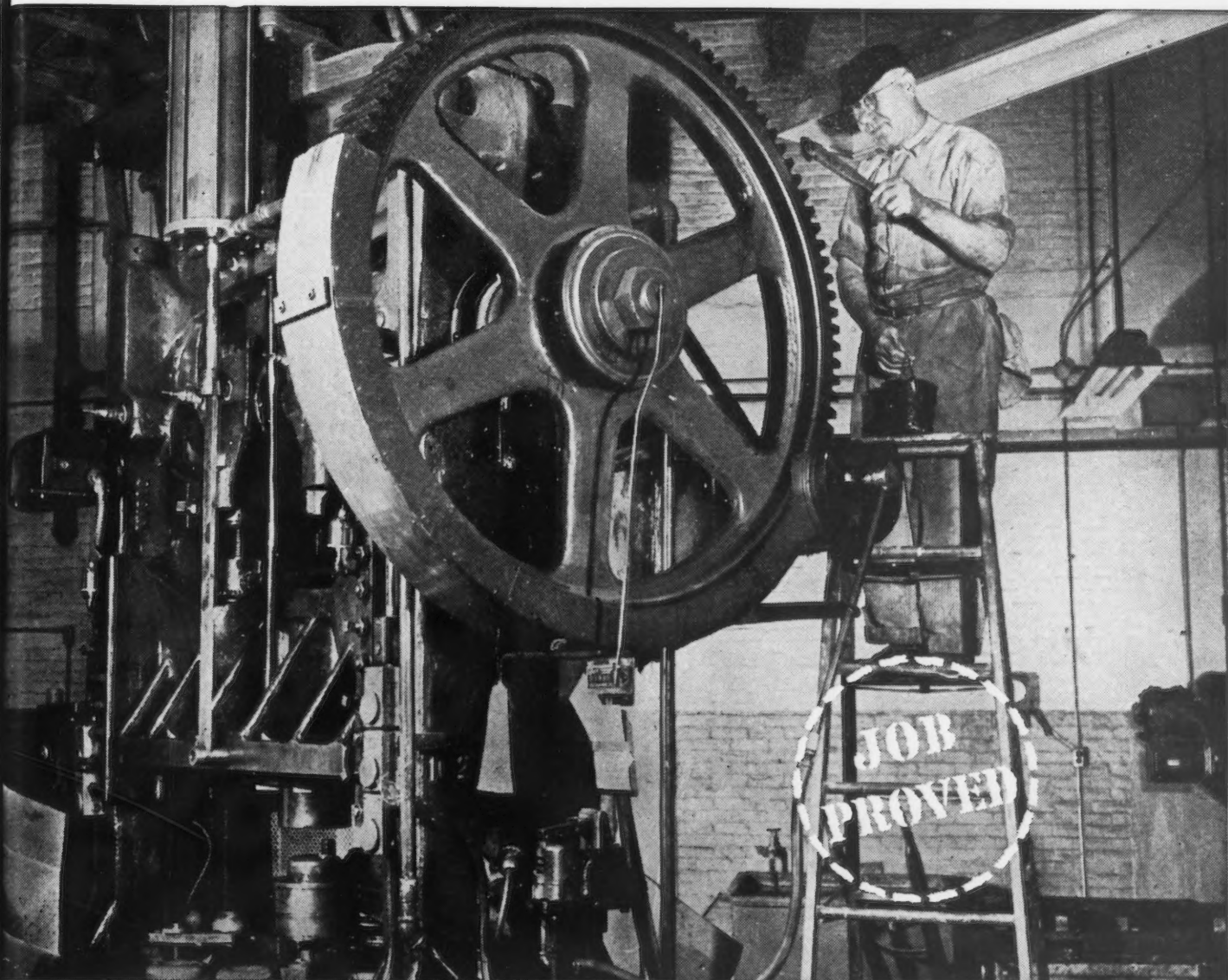
BUT their views should not be mistaken for the policy of the United States. The nationwide debate that followed President Truman's request for the Greek and Turkish appropriations was the most impressive testimony to the emotional and institutional obstacles that lie in the way of canalizing America's overwhelming economic strength into a sustained and effective foreign policy of any sort, be it imperialistic and aggressive or constructive and co-operative.

Faced with the daily exasperations of high prices and the dislocations mainly attributed to much publicized strikes, the average American is not certain that his community is much wealthier and more powerful than in 1939. Moreover, even an America that was fully conscious of its strength would be held back from using it by some of its most deeply rooted patterns of thought. The brake would be applied impartially to any active policy, whether of aggression or of cooperation.

The old combination of liberalism at home and isolationism abroad, of a forward policy in domestic matters and of no policy at all in foreign affairs, still holds good. The La Follette family may, for the first time in decades, hold no office either at Washington or in Wisconsin, but the pattern of their thought is very much alive. Some of the keenest opposition to the Truman Doctrine comes from those who believe that direct American intervention violates the rights of the United Nations and the criticism was strong enough to impel Senator Vandenberg to propose reservations designed to save face for the United Nations.

This specific support for the United Nations is one strand in a wider fabric of anti-imperialist, antimilitarist thought which should certainly not be dismissed as ineffective idealism. The anti-militarism has been sufficient in the course of the last 2 years to do away with conscription, drastically to reduce the army, to throw doubts on the full effectiveness of any volunteer system and, with the German peace treaty un-

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drafted and the Truman Doctrine looming ahead, to permit Congress to slash 10 pct out of the appropriations proposed for the various armed forces.

All this opposition to direct American intervention abroad on moral grounds fuses at the political level with the amoral but even more effective force of mere selfish isolationism. When Joseph Kennedy remarked that the best way to defeat communism was to make the American system work at home, he did not speak only for himself.

And when the House of Representatives, in a single day, gave J. Edgar Hoover all the funds he wanted for tracking down Communists in America and threw out the entire appropriation for the "Voice of America," the broadcasts by which the State Dept. hopes to explain the American way of life to the world, they demonstrated their relative concern for the internal and external aspects of America's anti-Communist crusade.

The more difficult and distasteful the problems of the outside world become, the greater is the temptation to Americans to concentrate on the world they really control and understand—which is their own United States. It is

easier and possibly more rewarding to build a TVA for the Missouri than for the Danube.

This is the emotional context in which the American political and economic system works. The structure of the system adds further impediments of its own to the development of a consistent, sustained and aggressive foreign policy.

It is difficult to believe that the next few years will abolish the old economic instability of the United States, the cyclical recurrence in its economy of recessions and depressions. The importance of these dislocations is not, as is sometimes supposed, the possibility that they will allow other nations, in particular the Soviet Union, to outstrip America in industrial strength.

The loss of wealth represented by even the most severe depression is not more, in real terms, than, say 20 pct, and with a national income running at some \$160 billions a year, the United States' margin of superiority over its competitor is far larger than that.

The importance of a depression to America's external relations is that it would enormously reinforce the instinct to concentrate on American problems to the exclusion of the outside world. Foreign

lending would cease as abruptly as it did in 1929. And the spectacle of the richest community in the world closing its factories and struggling with mass unemployment would probably knock the longest nail yet driven into the coffin of the free way of life.

But perhaps the greatest single obstacle to the emergence in America of a sustained and positive foreign policy is the nature of its political system. The division of power between President and Congress, the possibility of different parties controlling the one and the other, the lack of a Cabinet responsible to the legislature, the working of the party system, are all weighted against the present pursuit of long-term national or international objectives.

So long as the essence of the political struggle in the country is the conciliation of minorities and the avoidance of controversial topics, the great issues of foreign policy cannot be fairly placed before the electorate and later confidently worked out.

The spectacle today of the wool bloc in Congress, representing a minute fraction of American political life, pressing an increase in tariffs in the middle of the administration's attempt to lead the world to freer trade and lower tariffs is a typical example of the pluralism of objectives and scattering of efforts which characterize American politics.

FOR STARS OVER CHINA: Z. T. Tsang and Sidney Tsai, representatives of Chun Ho Co., Shanghai importing firm, get some pointers on a telescope solar transit at the Troy, N. Y., plant of W. & L. E. Gurley. L. C. Higbee, sales manager of the instrument firm, is explaining the transit to the Chinese who represent his company in Cathay.



92—THE IRON AGE, May 29, 1947

Canadian Nail Prices Up

Ottawa

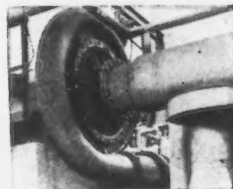
••• Wartime Prices and Trade Board has announced an authorized increase in the price of nails for Canadian manufacturers of 50¢ per 100 lb keg, which is said to be equivalent to \$10 per ton increase in the price of steel for the making of nails. Under the new price ceiling nails to the retail trade will be advanced 70¢ per keg. It is hoped that the price advance will stimulate production to at least 6500 tons per month. Board officials stated that the revision in the price ceiling has been authorized to offset a substantial increase in the cost of kegs and other raw materials, and to enable the diversion of greater quantities of basic steel to nail production.

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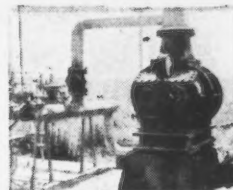
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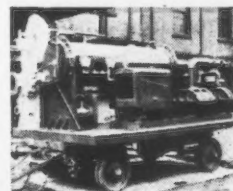
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ONE OF THE DRESSER INDUSTRIES

• **H. Webster Stull** has been named director of personnel, a newly-created position of the Mathieson Alkali Works, New York. Mr. Stull has been head of the Mathieson legal department.

• **Logan T. Johnston** has been appointed general manager of sales and **T. F. Olt**, director of research, of the American Rolling Mill Co., Middletown, Ohio. Mr. Johnston was a salesman for the Forged Steel Wheel Co. when that concern was acquired by Armco in 1927. After transferring to the company's home offices in Middletown, he was made manager of the railroad sales division in 1930. He was president of the Armco Railroad Sales Co. in 1937, when it was a subsidiary of Armco. On dissolution of the Railroad Sales Co. in 1945, he was appointed administrative assistant to sales management. Mr. Olt joined Armco in 1928 as a metallurgical assistant at the East Works plant. Two years later he became metallurgist. In 1932, he was made senior metallurgist at East Works. He was appointed senior research engineer in 1934. Later he became supervising metallurgist. In 1940, he advanced to associate director of research. He became assistant director in 1945.

• **L. P. McAllister** has been appointed assistant general manager, steel plants of Lukens Steel Co., Coatesville, Pa. Mr. McAllister entered the employ of Lukens Steel in 1922. He has since served the company as assistant engineer of tests, engineer of tests, metallurgical sales engineer, metallurgical engineer and assistant to the general superintendent. In the latter capacity he was in charge of quality control.

• **Carl J. Linxweiler** has been appointed sales manager of the Threadwell Tap & Die Co., Greenfield, Mass. Mr. Linxweiler has been sales manager of the machine tool division of the Sheffield Corp. at Dayton, of which the Threadwell Tap & Die Co. is a wholly-owned subsidiary.

• **W. Ledyard Mitchell**, vice-president and director of Chrysler Corp., Detroit, has retired. Mr. Mitchell was an executive of the Maxwell and Chrysler Corps. for more than 30 years.

PERSONALS

• • •

• **R. J. Seltzer**, for 4 years manager of the Sparrows Point, Md. plant of Rheem Mfg. Co., has been appointed manager of the company's eastern plants. Mr. Seltzer joined Rheem in 1938.

• **Don Loeber** has been appointed sales engineer in the New Jersey and metropolitan New York district for Cosa Corp. Mr. Loeber was formerly with the Eclipse Pioneer Div. of Bendix Aviation Corp. and also the Reconstruction Finance Corp.



KEMPTON DUNN, secretary-treasurer, American Brake Shoe Co.

• **Kempton Dunn** has been elected secretary of the American Brake Shoe Co., New York. He has been with Brake Shoe since 1932. Appointed treasurer of the company in 1942, he assumed the additional duties of assistant secretary of Brake Shoe and its Canadian subsidiaries in 1946. With his new appointment he becomes secretary-treasurer of the company. **Sumner T. McCall**, vice-president and secretary of American Brake Shoe, retires from active service on June 1. Associated with the company since 1910, he has held the positions of treasurer, secretary and vice-president. **Cyrus E. Brush** has been elected an assistant secretary of the company to serve with **Samuel S. Drury, Jr.**, also an assistant secretary. Mr. Brush has been serving with

Brake Shoe as an attorney since his return from service with the U. S. Navy.

• **Giles C. Hoyt** and **Gen. Levin H. Campbell, Jr.** have been elected executive vice-presidents of International Harvester Co., Chicago. **William E. Worth**, formerly executive vice-president, has retired after 27 years with the company. **Robert P. Messenger**, formerly vice-president in charge of the farm implement division, has been made vice-president in charge of foreign operations, succeeding Mr. Hoyt. **Ralph C. Archer**, formerly vice-president in charge of the farm tractor division, has become vice-president in charge of the farm implement division. **Michael J. Graham**, formerly assistant to the vice-president in charge of manufacturing, has been appointed general manager of the farm tractor division.

• **Arthur C. Martz** has been appointed manager of sales of the American Screw Products Co. of Detroit. He has been associated with the Brown McLaren Mfg. Co. of Hamburg, Mich., for the past 22 years in various capacities and of recent years as assistant sales manager.

• **Howard S. Thompson**, manager of pressed steel sales, has been promoted to assistant vice-president in charge of sales promotion, and **John E. Wallis**, assistant manager of pressed steel sales, has been promoted to manager of pressed steel sales of the Commercial Shearing & Stamping Co., Youngstown, Ohio.

• **John P. Stutsman** has been appointed director of industrial relations of the affiliated Shenango Furnace and Shenango-Penn Mold Co., Dover, Ohio. For the past 6 years he was a special agent for the Federal Bureau of Investigation. Prior to this he was employed by the Rio Grande Fuel Co.

• **J. H. Deaderick**, vice-president in charge of parts, service and traffic departments of the Caterpillar Tractor Co., Peoria, Ill., and **E. L. Murray**, credit manager of the treasury department, have both resigned their positions to join **Fred Elder** of Phoenix as Caterpillar distributor for the greater part of Arizona.

• **R. A. Weaver** has been elected chairman of the board of Ferro Enamel Corp., Cleveland, and he will continue to be the chief executive officer of the company. **J. D. Henry** has been elected vice-chairman of the board. **W. B. Lawson**, **C. D. Clawson**, **F. S. Markert** and **G. W. Wallace** have been added to the board of directors.

• **Vincent J. Calise** has joined the Liquid Conditioning Corp. of Linden, N. J., in the capacity of technical manager. **William A. Krebs** has been appointed engineering and sales representative in the district including Philadelphia, the counties in Pennsylvania close to Philadelphia, Southern New Jersey, and the state of Delaware for the company. Mr. Krebs' headquarters are in Philadelphia.

• **W. B. Livingston** has joined Ford Motor Co. to head its bus operations. His headquarters will be at Dearborn, Mich. Mr. Livingston was formerly associated with Yellow Cab Mfg. Co. and Yellow Truck & Coach Mfg. Co.

• **Charles J. Boyle**, recently in the sales division of U. S. Steel Export Co., New York, and before the war in the openhearth department of Carnegie-Illinois Steel Corp., is now associated with Steel Trading Corp., Pittsburgh.

• **Clarence W. Coe** has been appointed manager of the new Decatur, Ill., works of the General Electric Co.'s plastics division. Mr. Coe has been manager of the division's plant at Fort Wayne, Ind., operations of which will be transferred to Decatur.

• **Inwood Smith** has been appointed manager, refrigeration section, Crosley Div., Avco Mfg. Corp., Cincinnati. He succeeds Lee Stratton. Mr. Smith has been associated with Crosley since 1945 as regional sales manager of the central district, which includes Ohio, Kentucky, Michigan and Indiana.

• **R. M. Lindgren**, former chief engineer of Lincoln Park Industries, and **Paul E. Dimling**, formerly with Firth-Sterling Steel Co., have been appointed sales engineers for Metal Carbides Corp., Youngstown, Ohio.



K. U. WIRTZ, president, Electric Furnace Co.

• **K. U. Wirtz**, formerly executive vice-president of the Electric Furnace Co., Salem, Ohio, has been elected president of the company. The appointment fills the vacancy created by the recent death of R. F. Benzinger. Mr. Wirtz joined the Electric Furnace Co. organization in 1927 as an erection engineer. He has served in various capacities, including that of chief estimator, sales engineer and assistant secretary, before being advanced to the office of executive vice-president in 1946.

• **John M. Otter** has been promoted to the position of general sales manager of Philco Corp., Philadelphia. He has been a member of the Philco organization since 1926 and for the past 3 years he has been sales manager of the radio division.

• **William B. Ferguson** has joined the staff of Freyn Engineering Co., Chicago, in the capacity of electrical engineer. He previously served in a similar capacity at South Works of the Carnegie-Illinois Steel Corp. Prior to this he was at the Duquesne Works.

• **Niles Bartholomew** has been appointed director of industrial engineering of the Carborundum Co., Niagara Falls, N. Y. He recently has been manager of the television tube plant of Corning Glass Works and during the war served as factory manager of the Curtiss-Wright plant at Louisville.

• **Harold C. Lumb** has been named assistant general counsel for Republic Steel Corp., Cleveland. Prior to and following his return from active duty in the U. S. Naval Reserve, Mr. Lumb was associated with Jones, Day, Cockley & Reavis.

• **J. A. Baldinger** has been named assistant to the general manager at Automatic Transportation Co., Chicago. Mr. Baldinger's promotion comes after nearly 2 years as assistant sales manager of Automatic's truck division.

• **Walter E. Schmidt** has been appointed resident engineer of the new Chevrolet Motor Div., Flint, Mich., assembly plant. He has been an employee of Chevrolet engineering department for the past 17 years. **R. H. Hirschert** will assist Mr. Schmidt in the Chevrolet engineering department.

• **J. A. Keogh** has been elected vice-president and comptroller of the Allis-Chalmers Mfg. Co., Milwaukee. **H. W. Story** has been elected vice-president and general attorney; **W. E. Hawkinson**, secretary and treasurer; **E. H. Brown**, vice-president in charge of engineering development; **W. C. Johnson**, vice-president in charge of the general machinery division; **W. A. Roberts**, vice-president in charge of the tractor division, and **James M. White**, vice-president in charge of manufacturing. **J. F. Ryan** has been named assistant secretary and assistant treasurer; **A. F. Rolf**, assistant secretary; **C. P. Allendorf**, assistant comptroller; **N. D. Johnson**, assistant secretary, and **G. F. Langenohl**, assistant treasurer.

• **R. W. Kerr**, formerly vice-president and treasurer of the Plomb Tool Co., Los Angeles, has been made executive vice-president. **H. C. Baumgartner**, formerly secretary and comptroller, has been made secretary and treasurer.

• **Clark E. Korn** has been appointed supervisor of industrial relations for Youngstown Sheet & Tube Co.'s Chicago district plants. Mr. Korn came to the company in 1940 as assistant to the general superintendent of the strip and tin mills at the Indiana Harbor works. He succeeds Herman J. Spoerer.

• **W. T. McCurdy** has been made district manager for the states of Tennessee and Arkansas for Mack Trucks, Inc. Since joining Mack in 1925 he has served successively as sales promotion engineer, assistant sales promotion manager and assistant manager of export sales. He will make his headquarters in Memphis, Tenn.

• **Lyman W. Slack**, vice-president and general sales manager of Packard Motor Car Co., Detroit, has been elected to the board of directors of the company. He joined Packard in 1934 in the sales promotion department.

• **Irby L. O'Brien** has been appointed as assistant general traffic manager of the Monsanto Chemical Co., St. Louis. Mr. O'Brien was associated with the Illinois Central R.R. from 1923 until he joined Monsanto.

• **W. J. Mair**, superintendent of International Business Machines Corp. Plant 2 at Poughkeepsie, N. Y., has been promoted to the position of works manager. **Joseph McManus**, who had been serving as assistant superintendent, has been made superintendent. **F. Paul Deuell** has been promoted to be manager of the personnel department at the same plant.

• **J. H. Jewell** has been appointed manager of apparatus sales of the Westinghouse Electric Corp., with headquarters in Pittsburgh. A veteran of 27 years with Westinghouse, Mr. Jewell has been manager of the company's industry sales departments since 1944. He has been serving recently as acting manager of apparatus sales.

• **John B. Ives** has been appointed manager of operations of Laclede-Christy Clay Products Co., St. Louis. He reports directly to the general manager. In this capacity Mr. Ives will have complete charge of the manufacturing and mining operations of the St. Louis and Toledo plants and mines. Mr. Ives brings to his new position over 20 years of varied experience in all phases of the company's manufacturing operations. For many years he was superintendent of the Toledo plant and for the past 5 years has been general superintendent of plants and mines.

• **Arthur W. Bull** has been appointed chief engineer at Michigan Wire Cloth Co., Detroit. He previously was a project engineer at King-Seeley Corp. Concurrently, Michigan Wire Cloth Co. has established a research and development department with Mr. Bull in charge.

• **D. W. Thomas**, manager of sales, tin mill products, Jones & Laughlin Steel Corp., Pittsburgh, has been appointed assistant general manager of sales. **John E. Timberlake**, manager of sales, wire products, has also been made assistant general manager of sales. **John O'H. Anderson**, assistant general manager of sales, has been appointed district sales manager in New York. **S. A. Fuller**, New York district sales manager, has been named to the newly-created post of manager of the markets research department. **H. A. Knox**, assistant manager of sales, tin mill products, has been appointed manager of sales of that division. **C. E. Kendall**, assistant manager of sales of wire products, has been made manager of sales, wire products, and **D. J. Henecker**, assistant manager of sales, wire products, has been appointed manager of sales, wire rope products, a newly-created position.

• **Thomas H. Stambaugh** has been appointed sales manager of the Monroe Auto Equipment Co., Monroe, Mich. Mr. Stambaugh comes to Monroe from the Hudson Motor Car Co., where he spent 13 years as parts and accessory merchandising manager and later director of national servicing operations. In his new position at Monroe, he succeeds **John Black**, who has retired.

• **Charles H. Godschall**, who has served as manager of the metal division of Philco Corp. for the past 8 years, has been named works manager of the large new Philco refrigerator-freezer production facilities in Philadelphia.

• **Joseph N. Tellier** has been appointed New York sales manager of the Taft-Peirce Mfg. Co. of Woonsocket, R. I. He succeeds **E. B. Capron** who has retired after many years with the firm.

• **Robert H. Binkerd** has been appointed purchasing agent of the Alco Products Div. of the American Locomotive Co. with headquarters in Dunkirk, N. Y. **Henry Newman**, who has served as foreman of the gunshop tool room in Dunkirk, has been promoted to foreman of both the gunshop and machine shop tool departments.

• **Harold V. Schmidt** has been appointed to the new position of manager of the Buffalo shops of the Western Electric Co., located in the former Kenmore Ave. plant of the Curtiss-Wright Corp. He formerly was superintendent of Western Electric's relay shops at the Hawthorne plant in Chicago.

• **H. T. Rowe** has been appointed advertising manager of International Business Machines Corp., New York. Since 1946, when he joined IBM, he has been serving as special assistant to C. A. Kirk, executive vice-president.

OBITUARY...

• **S. L. G. Knox**, 76, former vice-president and chief engineer for the old Bucyrus Co., South Milwaukee, died May 8.

• **E. M. Moore**, 49, president of the Sutton Tool Co., Sturgis, Mich., died on May 3 as the result of injuries received in an automobile accident recently.

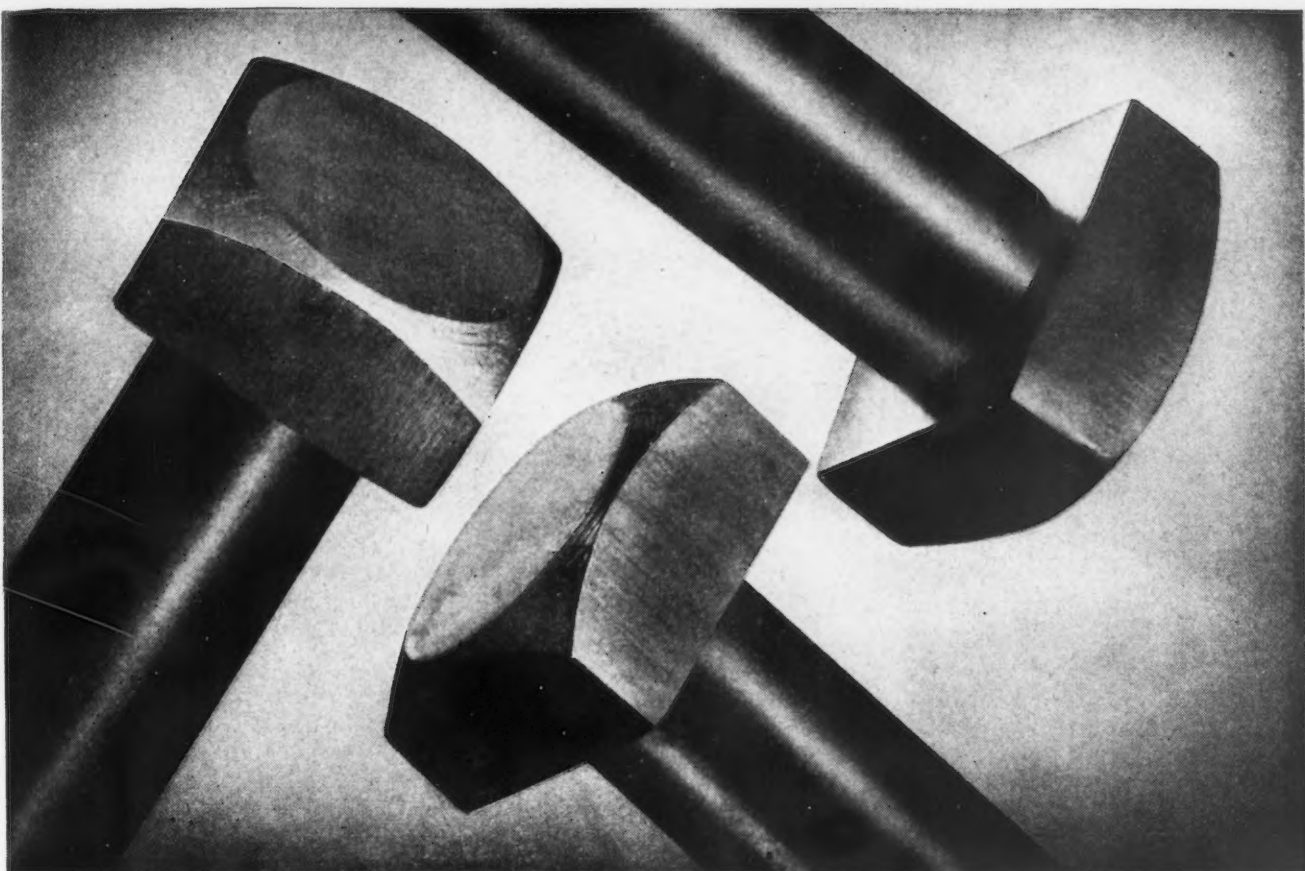
• **H. M. Lowe**, formerly Nash Motors Div. assistant parts and service manager in Detroit, died recently.

• **August H. Tuechter**, president of the Cincinnati Bickford Tool Co., Cincinnati, died recently.

• **Paul T. Payne**, 67, district manager of Dearborn Chemical Co., Indianapolis, died Apr. 7. He became associated with the Dearborn Chemical Co. as a laboratory technician 49 years ago.

• **Robert H. Lawson**, assistant controller of Wyandotte Chemicals Corp., Wyandotte, Mich., died May 15.

• **Harold H. Himrod**, 57, secretary of the Birmingham Slag Co., Birmingham, Ala., died suddenly May 9.



**WHEN YOU SAVE PRODUCTION TIME BY
USING FEWER TYPES AND SIZES...THAT'S**

t.f.e.

**True
Fastener
Economy!**

It's the cost of using a fastener that counts

And an important part of the cost of using a fastener is the cost of maintaining inventories, requisitioning from stock, handling many different styles and sizes. Careful analysis of fastening requirements and standardization on fewer types and sizes will help to speed up production and lower costs.

**RB & W Machine and Carriage Bolts
Offer You Unlimited Variety**

RB&W engineers are available to help you determine the minimum variety of types and sizes of bolts and nuts which will meet your needs. And RB&W offers the maximum range of product, a choice of many special metals, and the facilities of a versatile finishing department—from a single source of supply.

You Get T. F. E. When You

1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners
2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
4. Reduce the number and size of fasteners by proper design
5. Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners
6. Simplify inventories by standardizing on fewer types and sizes of fasteners
7. Save purchasing time by buying larger quantities from one supplier's complete line
8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

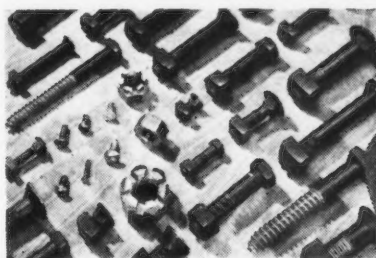
RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

102 years making strong the things

that make America strong

RB&W bolts, nuts, screws, rivets and allied fastening products are manufactured in a broad range of styles, sizes and finishes.

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service from his stocks for your normal needs. Also—the industry's most complete, easiest-to-use catalog.



Dear Editor:

PACKARD CONVERTIBLES

Sir:

My attention has just been called to an article appearing in the automotive section of the Apr. 3 issue to the effect that lack of frames was responsible for the delay which Packard has encountered in getting started on their new convertible models. This is not in accordance with fact. Our company has done an exceptionally fine job on this Packard frame, and frames are in the Packard yard. If you will investigate, I am sure you will find that other troubles must be responsible for any delay in getting production started . . .

F. F. GREGORY

A. O. Smith Corp.
Milwaukee

● The statement was based primarily on an announcement by Packard that inadequate supplies of materials and parts, including specially-built frames, would prevent the company from hitting its production stride on the convertible before early June. Further investigation discloses, however, that shortly after the first of this year a deadline was established for the first delivery of frames to Packard, and that the first frames were delivered in the quantities planned exactly as promised. We regret if some of our readers may have been led to believe that any delay in producing Packard convertibles might have been caused primarily by a shortage of frames. —Ed.

CONDUCTIVE GLASS

Sir:

Please advise where we may obtain more information regarding the new glass which has a slight conductivity, permitting an electrical charge to be passed through it, as mentioned in Newsfront of the Apr. 24 issue.

JOHN T. PARSONS

Parsons Industries, Inc.
Traverse City, Mich.

● For further information write Libbey-Owens-Ford Glass Co., Nicholas-Hawkins Bldg., Toledo 3.—Ed.

LABORATORY INSTRUMENTS

Sir:

I would be grateful for tear sheets of the compendium "Basic Characteristics of Useful Industrial Laboratory Instruments," appearing on pp. 58-61 of the May 1 issue.

H. B. EMERICK

Assistant Metallurgist
Jones & Laughlin Steel Corp.
Aliquippa, Pa.

SILVER BRAZING

Sir:

We are interested in obtaining more information on silver brazing alloys. We understand that an article by John B. Ross entitled "Designing for

Silver Brazing With Induction Heating" appeared in your Dec. 26 issue. We will appreciate receiving a reprint of this article.

E. H. DAVIS
Product Engineer

Herman Nelson Corp.
Moline, Ill.

NEOPRENE TO METAL

Sir:

We are interested in an adhesive to fasten Neoprene to metal. Can you suggest a source for such material?

S. E. GREGORY

Heyer Corp.
Chicago

● Send full particulars regarding the requirements to be met, to E. I. du Pont de Nemours & Co., Neoprene Div., 350 Fifth Ave., New York, attention of Mr. Burns. They have such an adhesive.—Ed.

SPARK TESTERS

Sir:

In the issue of July 18, 1946 there appeared an article, "Training Spark Testers." I would appreciate a copy of this article.

DONALD B. FULMER
General Foreman
Cold Drawn Dept.

Bethlehem Steel Co.
Bethlehem, Pa.

IHRIGIZING

Sir:

I was very interested in reading H. K. Ihrig's article "Silicon-Impregnated Steels," in the Apr. 4, 1946 issue, p. 73 and would be obliged if you would kindly give me the addresses of the manufacturers who use the process and any further information, in order to let our society perform some tests.

M. SCHERER
Ingénieur, A. M.

Société Nationale des Chemins de
Fer Français
Paris

● We are forwarding your letter to the author of the article, Harry K. Ihrig, Director of Laboratories, Globe Steel Tubes Co., Milwaukee 4, suggesting that he get in touch with you directly.—Ed.

HOT-DIP GALVANIZING

Sir:

We are writing to ask if you have available tear sheets of W. G. Imhoff's interesting article "Effect of Lead in Hot-Dip Galvanizing Baths" which appeared in the Jan. 9 issue.

CARLETON C. LONG
Director
Plant Research Dept.

St. Joseph Lead Co.
Josephtown, Pa.

DESIGNING A NEW PRODUCT

Sir:

Will you please send me two sets of tear sheets of your Oct. 31, 1946 article "So You're Designing a New Product."

W. B. HARTLEY
General Purchasing Agent
Perfect Circle Corp.
Hagerstown, Ind.

SAND BLASTING EQUIPMENT

Sir:

We need a sand blast unit for cleaning iron etc., with tank capacity of approx 50 lb of sand . . . Can you inform us of a few manufacturers of such equipment . . .

H. REYMAN

H. Reymann
Jersey City, N. J.

● A list of some of the larger manufacturers is being forwarded to you.—Ed.

MOTOR MEMORIES

Sir:

Where can we get a copy of Eugene W. Lewis' book "Motor Memories" as mentioned in the Assembly Line of the May 1 issue?

J. H. FISHER

New Holland Machine Co.
New Holland, Pa.

● Robert L. Perry, 530 New Center Bldg., Detroit 2, is acting as agent for the publisher of "Motor Memories."—Ed.

HOT-COLD PIPE

Sir:

In your May 1 issue under News and Markets you indicated an article on p. 133 titled "New 'Pipe' Makes Hot and Cold Air." Would you please tell me when you intend to publish this article, since it does not appear as listed in this issue.

R. J. RYBARCHYK
Electrical Dept.

Allis Chalmers Mfg. Co.
Milwaukee

● The article appeared in the May 8 issue. Unfortunately last minute changes did not permit correction in the May 1 index.—Ed.

TIME STUDIES

Sir:

We are very desirous of securing a copy of the pamphlet "Method Simplification Applied to Time Study" which was reprinted from the issues of Aug. 17, Sept. 28 and Oct. 19. Anything you might do to make this possible will certainly be appreciated.

N. W. SNASHALL

Head of Time Study & Methods
Zenith Radio Corp.
Chicago

● A booklet, "Techniques and Time Study—Incentives and Job Analysis," contains a series of articles on time study calculations, method simplification as applied to time study, incentive plans and job evaluation. Copies are available to readers at 60¢ each.—Ed.



STEP-SHAFTS AIR-TRACED

for greater economy

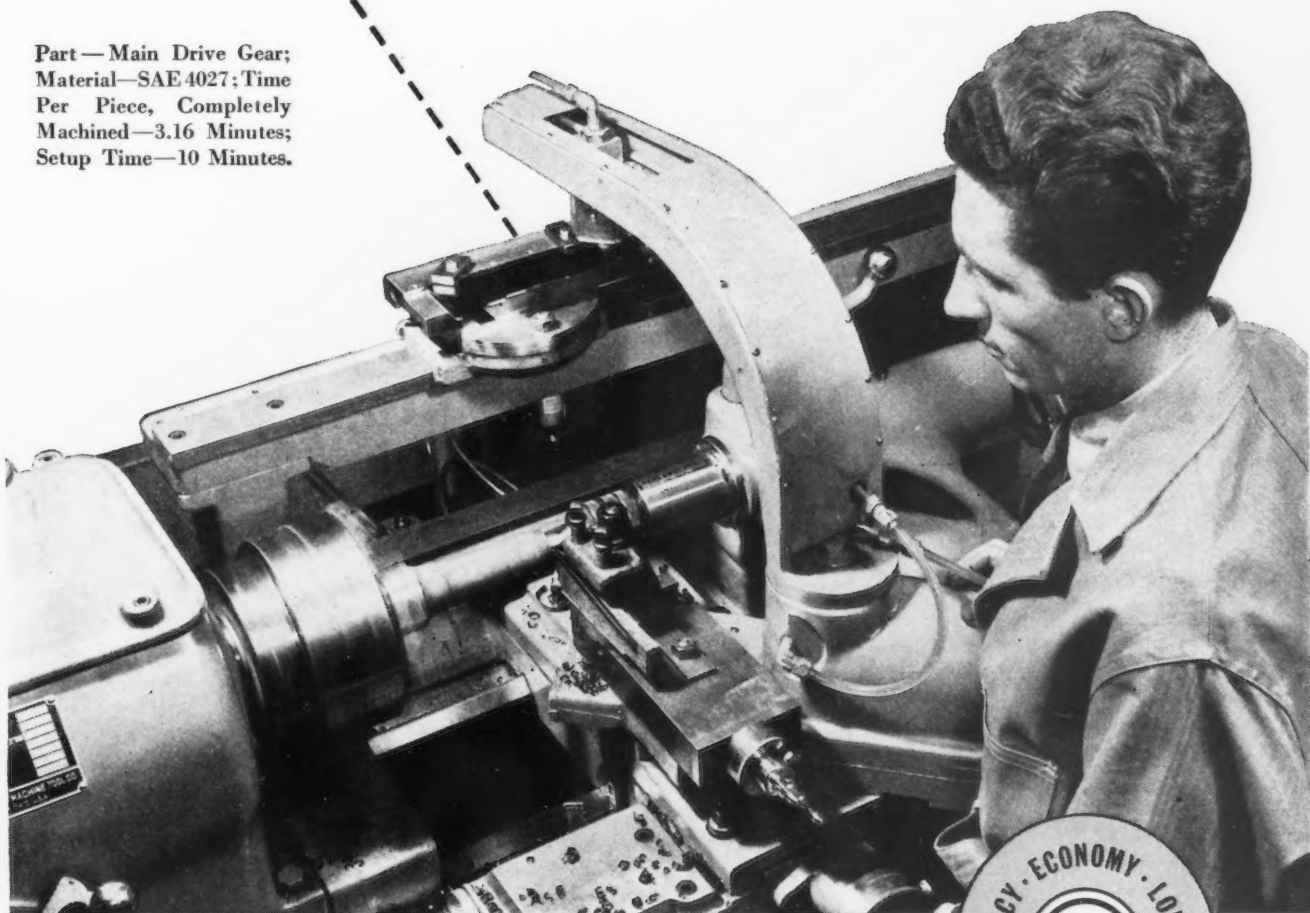
Part—Main Drive Gear;
Material—SAE 4027; Time
Per Piece, Completely
Machined—3.16 Minutes;
Setup Time—10 Minutes.

Turning step-shafts? Here's how to save—on setup time, on resharpening time, on machining costs—and on original machine investment.

The gear blank shown is a typical example. Turned on a multiple-tool automatic, the setup requires anywhere from 2 to 3½ hours. When AIR-TRACED, although machining time is the same, setup is *only ten minutes or less*. There's only one lathe tool to sharpen—and the machine is easily adaptable to a wide range of work—boring or turning—contours, tapers, step-shafts. Accuracy is greater, too, because operation is stepless, continuous—and *automatic*. There's less chance for human errors. Result? Fewer rejects, lower machining costs.

May we show you how the Monarch Air-Tracer can give you accurate, economical high production on your class of work? Ask for bulletin 2601.

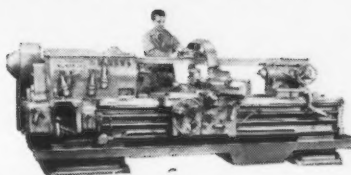
THE MONARCH MACHINE TOOL COMPANY
Sidney, Ohio



FOR SPEED, ACCURACY AND FINISH, THE MONARCH AIR-TRACER*

1. Stepless cutting-tool motion provides a superior continuous finish.
2. Setup times averaging five to ten minutes permit profitable use for a wide variety of small-lot production jobs.
3. Automatic yet versatile operation results in economical, accurate high production.

*Available exclusively on the new Monarch Lathes.



Industrial News Summary...

- **Steel Scrap Prices Firm With Rise**
- **Ingot Output Unchanged at 96.5 Pct**
- **British May Get Very Little Steel**

FOR the first time since it began late in March to drop from its postwar peak, the scrap market shows signs of strength this week. Quotations on heavy melting steel are up \$2.50 a gross ton at Pittsburgh. While few major changes have been made in other areas, prices are firm there.

The current strength may not be the forerunner of another upward trend but, on the contrary, a continuation of stabilization effects on the market. Severe tests have been placed on recent prices and the change at Pittsburgh may be the beginning of the establishment of a proper relationship for scrap prices in various areas. Some large consumers are already resisting the stronger tone and are restricting some shipments.

THE IRON AGE steel scrap composite this week is up 92¢ a gross ton to \$30.42 per gross ton. Last week's figure of \$29.50 a gross ton was the low for the year and the high of \$39.67 a gross ton was registered in the week of Mar. 17.

STEEL output this week continued to roar on its way towards an annual rate of close to 88 million tons. If nothing occurs to seriously reduce the present rate, which this week is unchanged at 96.5 pct of rated capacity, the yearly output would approximate the wartime record of 89 million tons. Even though this level is not reached, it is now almost certain that all previous peacetime records will be smashed.

New methods and techniques are being rushed forward by the steel industry to reduce steelmaking unit costs. Following a joint effort between a steelmaker and a manufacturer of oxygen to push the use of oxygen in the openhearth, another large steel company now plans to produce oxygen on a large scale in its own plant in order to speed production and increase productivity. Increased use of hot metal from bessemer converters for the production of openhearth steel in order to defeat the long-term scrap shortage is seen in recent orders for new bessemer steel equipment.

Although private talk in the steel industry leans toward the opinion that steel demand will be slower by the end of this year or in the first quarter of 1948, there are no significant signs of large-scale contraction in the current market picture. For some miscellaneous products such as narrow hot-rolled strip, demand has declined recently. Requirements from manufacturers of some types of home appliances continued to contract as manufacturers become worried about inventories. Latest items to join this list involve coal heating equipment, beverage coolers and deep-freeze units.

ON THE other hand the automobile industry still clamors for cold-rolled sheets in order to maintain its high rate of production. Some of the present stoppages in Detroit are due to shortages of nuts,

bolts, rivets and copper in addition to flat-rolled material. Many automotive companies are obtaining greater amounts of steel ingots and having them processed by steel companies whose finishing equipment exceeds their steelmaking capacity. More and more arrangements of this type are expected in the future as every effort is expended to step up the distribution of flat-rolled products.

In the midst of the temporary domestic shortage of various steel products, there is little chance that the British inquiry for 1.2 million tons of steel can be met even fractionally. Most large steel companies are refusing to make any firm commitments whatsoever on the British steel inquiry which covers requirements for the fiscal year June 1947 to June 1948.

Included in the British inquiry are the following products: 260,000 tons of ingots, 325,000 tons of billets, 260,000 tons of slabs, 60,000 tons of sheet bars, 20,000 tons of semifinished blooms and rounds, 140,000 tons of wire rods and 100,000 tons of finished steel products. Major reasons for the black outlook in filling such an inquiry in this country are: present domestic shortage, heavy demand from Detroit and the reluctance to ship semifinished steel abroad in the face of a long-term scrap shortage in the United States.

DESPITE all the talk in this country about more railroad cars and the freight car shortage, April car output was approximately 4123 freight cars against a current goal of 7000 a month. But shipments to freight car builders from steel companies have been stepped up considerably. By August it is expected that the freight car program will be nearing the 10,000 car-a-month target set for that time. Wheels, axles and bearings may prove a bottleneck, but even this threat may be removed by that time if overall steel demand more nearly approaches normal levels.

ACCORDING to reports from the West Coast, there has been a noticeable slowing up in sales there of shapes and plates. The decline, however, is not considered to be serious. Demand for these products remains at a high level in the East and the Middle West. Requirements for oil country casing continue heavy and a pipe shortage has cut drilling for gas in the Ohio area to such an extent that 25 wells in the Canton area alone have been capped due to a casing shortage.

A survey of some steel producers does not indicate that the present pricing policy of "price at time of shipment" is due for any change in the near future. No large companies are as yet ready to quote customers on a firm quarterly basis. Some firms, however, have been giving thought to this problem but no action can be taken under present conditions, it has been argued.

• **LITTLE PROGRESS**—Despite all the publication about the railroad freight car situation and the untold number of meetings in Washington, freight car production for the first 4 months of this year was only slightly better than 1946. Class 1 railroads put 11,348 new freight cars in service the first 4 months of this year, of which 4099 were installed in April. New freight cars put in service in the 4 months of 1946 totalled 11,115. Installation of new locomotives, however, are far ahead so far in 1947 than last year. Two hundred and eighty-six new engines were put in service in the first 4 months of 1947 of which 40 were steam and 246 were diesels. New locomotives installed in the same period last year totalled 59 of which 29 were steam and 30 were diesels.

• **DEFEATED AGAIN**—For the 11th time, Armco Employees Independent Federation at the two Middletown, Ohio, plants of American Rolling Mill Co., defeated the USWA-CIO in a National Labor Relations Board election. The defeat for CIO representation of the two plants was more than 2 to 1, and the total eligible voters was 4400.

• **STAINLESS STEEL SCRAP**—Sheet bundles of stainless scrap have been moving at prices sharply down from those during the early part of the year. From a peak of \$102.50 a ton in February, grades 302, 304, 321, and other high nickel-high chromium analyses have fallen in price to a range of about \$80 to \$90 a ton. The broker buying prices run about \$5 a ton under the delivered prices. The 301 stainless classification is selling for less than the higher alloy grades. The declines in price reflect the drop in the demand for stainless steel, which is off sharply since the turn of the year. Some stainless items are being delivered on a "processing" lead time, a situation not in evidence in any of the carbon steel items.

• **STAINLESS STEEL PRICES FIRM**—An extended period of softness in demand for stainless steel products has encouraged some consumers to anticipate lower prices in the immediate future. Producers who have been studying the market recently have come to the conclusion that there can be no decrease from current published prices in view of high labor and materials costs.

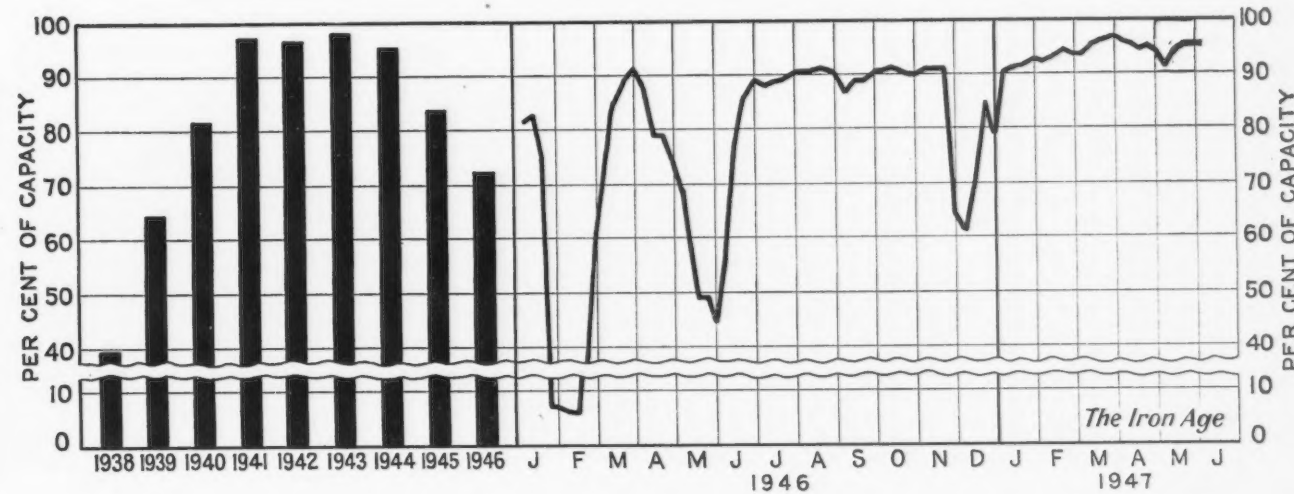
• **SURPRISE, SURPRISE!**—Some manufacturers, anticipating large and unbalanced inventories, when they make their annual check as of June 30 are attempting to pare down these supplies. In recent weeks some material has been sold in the open market by steel users. This has indirectly depressed the so-called gray market price structure. In other cases users have been more careful in placing new orders so that extra large inventories of certain products can be used up more rapidly. This trend is expected to be prevalent throughout the manufacturing industry over the next few months.

• **COKE PLANT SURPLUS**—A coke plant, built to supplement Colorado Fuel & Iron Co. facilities at Pueblo, Colo., and the Birdsboro Steel Foundry & Machine Shop, Birdsboro, Pa., are among 27 wartime surplus facilities formally declared surplus to WAA. These plants have not been processed for sale or lease. However, the CF&I facilities built by the government consisted of a battery of 74 Koppers combination ovens with a rated capacity of 327,000 tons of coke annually and related equipment.

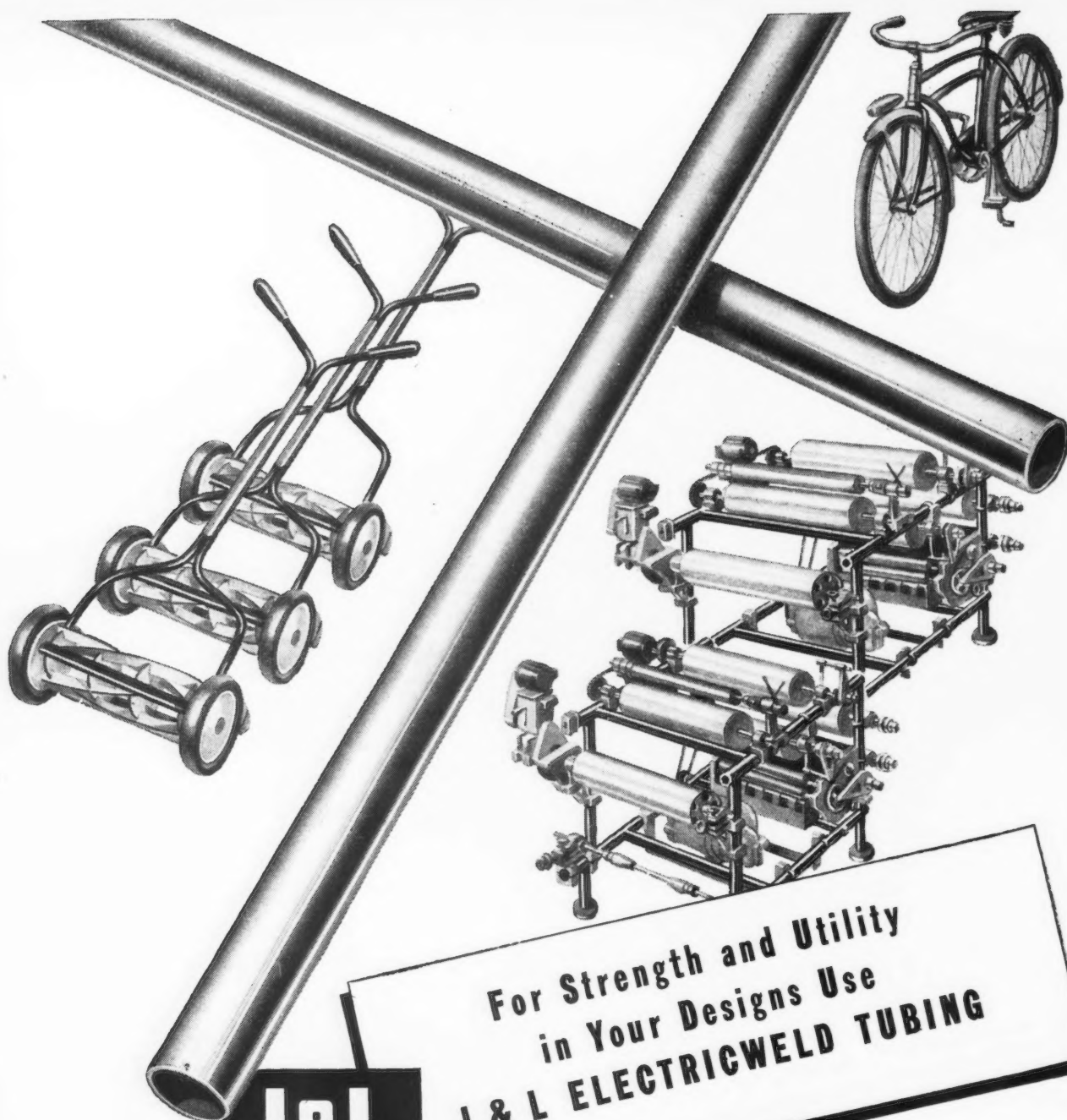
• **PASSENGER CAR REGISTRATION**—New passenger car registrations for April may exceed 300,000 and new truck sales are continuing at a record pace indicating that 75,000 units will be registered, according to R. L. Polk & Co. The large increase predicted for April is partly accounted for by seasonal trends and also by increased new car output during the month. Figures from 41 states tabulated show passenger car registrations for March at 181,617 units. March new truck sales as reflected by registration figures are at record levels and should exceed 75,000 to set an all-time high for the truck industry.

• **STRAWS IN THE WIND**—According to some producers demand from small companies making finished products such as radios, automotive parts, washing machines and other home appliances has eased. Principal products affected have been narrow strip and certain small bar shapes. In some cases consumers who were exerting terrific pressure for deliveries a week ago are now even postponing some shipments. This situation has not yet become widespread nor has it reached wide flat-rolled product markets. The big question in the trade is whether or not this is the vanguard of a general easing in steel demand.

Steel Ingot Production by Districts and Per Cent of Capacity



* Revised.



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STEEL**

**For Strength and Utility
in Your Designs Use
J & L ELECTRICWELD TUBING**

The inherent strength of J&L Electricweld Tubing is being used to advantage by many designers in making new products where resistance to compression and other stresses without increasing weight are important factors. They find it gives them an opportunity to design better equipment—increase service and eye-appeal.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

New Phase in Management-Labor Relations Seen as Real Thing

New York

• • • Diehards on both sides may not believe it, but management-labor relations are entering a new phase. Elimination of the steel strike threat this year was followed by closer understandings on both sides. This feeling is so strong that steel officials and labor leaders have taken active steps to prevent future tieups and "sore spots."

In some steel firms organization of industrial relations work has been revised. New men have been appointed and heads of the department in many cases are reviewing and putting into practice more and more human engineering.

In other instances production heads have been made solely responsible for industrial relations. Experts in the latter have become staff advisers whose counsel is sought and whose opinions now carry much weight. Under these changes officials believe there will be less buck passing and rapid clean-up of situations before they reach the troublesome stage.

Labor is also making changes in its plans. Philip Murray both publicly and privately has told union district heads and local union officials that current contracts must be lived up to. There was no quibbling in his statement to his people, the major portion of which was as follows:

"(1) We must meticulously respect the provisions of the collective bargaining contract.

"(2) That under no circumstances must there be work stoppages during the life of the agreement.

"(3) We must resort to the orderly methods of adjudicating our differences by taking recourse to the grievance procedures of the wage agreement up to and including arbitration.

"These things are so vital to preserve the integrity of the contract and the union that all local union officers and grievance committeemen should give notice to this effect to the members in our local union meetings.

"It is further suggested that this circular letter be posted in local union halls and wherever

Management Makes Changes In Policies While Steel Labor Bans Tieups

• • •

By TOM CAMPBELL
News-Markets Editor

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possible on bulletin boards in the various plants."

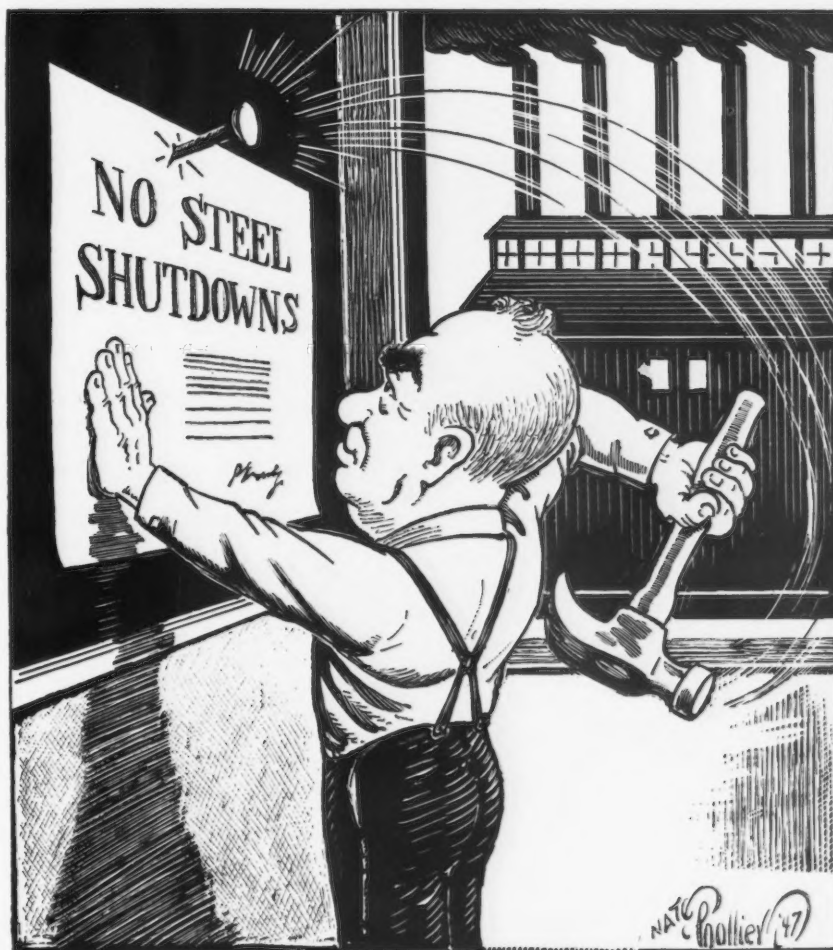
There is no doubt that steel management and labor have reached the point of diminishing returns as far as prices and wages are concerned. Neither side can afford any more crises in the wage situation for some time to come. Both appear to know this. The current effort towards unprece-

dent cooperation and recognition of mutual problems is not based on "love - dovey" pronouncements but on realistic self-interest.

Those officials whose duty it is to get out more steel at lower cost privately admit that much can be done towards better human relations. Labor leaders are also frank in admitting that a new phase in their relationship with companies is in order. With the government rapidly fading from the labor picture, industrial relations men and union officers see the possibility of true collective bargaining over the next several years.

In past periods observers recall that too much lip service was given to the industrial relations problems and not enough to the human approach. A definite sur-

A Good Sign



vey of labor and management in the past few weeks indicates that the current trend in the steel labor picture shows signs of being one of the most far-reaching and constructive phases in the past 10 years.

Much credit for this new outlook belongs to industrial relations managers who have been able to eliminate prejudices and the effects of past labor strife in order to clear up current troubles.

Heavy Steel Equipment Order Backlogs Running More Than 18 Months

Pittsburgh

• • • Backlogs of orders for heavy steel mill equipment and for materials handling equipment are running longer than 18 months. Demand for certain types of metal processing equipment, however, is showing signs of easing off, even though orders already on the books are heavy.

A major producer of steel mill equipment indicated recently that orders on hand are sufficient to maintain full-scale operations for at least 2 years and anticipated business appears to be good. The new business, both foreign and domestic, that is developing makes it impossible to trim down the

Credit also goes to that top management which have supported their advisers. Labor officials, on the other hand, appear to have lost a great portion of their suspicions of management's good intentions. Both sides will continue to bargain for the best possible terms, but this bargaining it is believed will take place with the realization that public trends and opinions are just as important as those of management and labor.

amount of incomplete contracts.

Foreign business for steelmaking equipment is primarily from Brazil, but some Chilean business is now under consideration. While there is considerable new business from France for steel finishing equipment, there is very little activity in the steelmaking end. Russia, a big buyer during the war, is presently out of the American markets and some of the equipment built during the war for Russia has not yet been delivered.

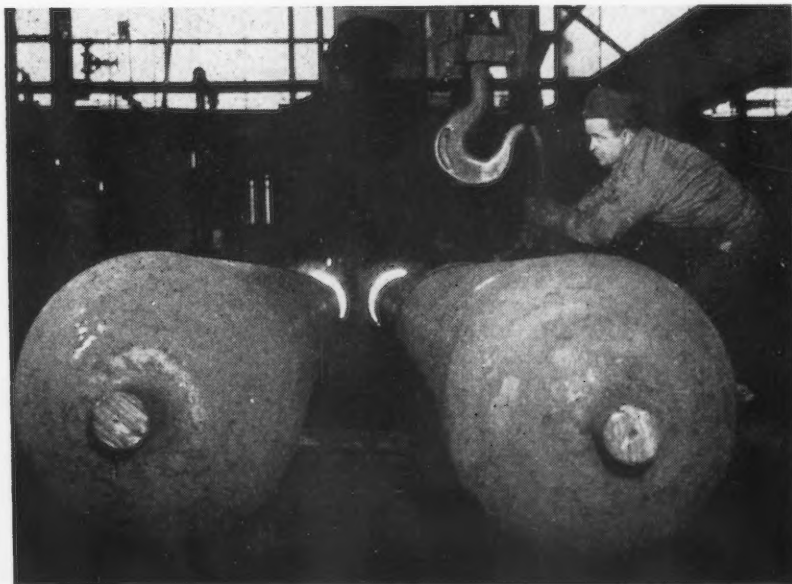
Materials handling equipment demand by metal processing and fabricating plants appears unlimited, with deliveries on engineering equipment running upwards of 12 months. Actually, with deliveries quoted so far ahead, new orders may mean nothing because of the inability of the purchasers to determine what may develop

within the lead time. As one producer stated recently, his salesmen claim that the greatest optimist books the new business and then has to make excuses when the delivery date rolls around.

Manufacturers of metal fabricating equipment such as presses, shears, brakes and spacing tables have noticed an easing in new business but still the backlog is between 6 and 12 months. April bookings were off somewhat from the previous three months, but this may be accounted for by customer hesitancy in the face of the possible steel strike.

Manufacturers of industrial equipment are becoming constantly more aware of unbalanced inventories. Acute shortages in some items still exist, but where heavy inventories have built up they are being sold. Such items fall mainly in the material classification rather than the fabricated part classification. Such items as bearings, chain, electric motors, and similar fabricated items are generally in very short supply. One manufacturer of industrial equipment has been shipping machines without motors because they are not available and then following at a later date with the delivery of the motor. This permits the customer to install and set up the equipment and the manufacturer tries to match the completion of the installation with a motor.

GAS GOES UNDER AGAIN: *National Tube Co., in conjunction with Public Service Co. of Northern Illinois is working on a 40 million cu ft underground gas storage plant for Mt. Prospect, Ill. In the National Tube McKeesport, Pa. plant workers are heating the end of a 24-in. seamless molybdenum steel pipe which is 40 ft long and will store 25,000 cu ft at 2240 psi.*



Open House at Youngstown

East Chicago, Ind.

• • • Thousands of spectators trooped through the Indiana Harbor plant of the Youngstown Sheet & Tube on May 28, which was open house day. All persons over 14 years of age were admitted and the plant gates were open from 9 A.M. to 3 P.M.

Visitors were taken through the openhearth and bessemer shops and the tour included the rolling mill, from the bloomer on down to the merchant mill. Hundreds of high school children took advantage of open house day. A special exhibit of finished steel products made from Youngstown steel was shown at the tin mill. The most popular question asked in the openhearth department by visitors was "What do you do with the big bucket behind the furnace?"

Senate Group Hears More Weird "Gray Market" Steel Stories

Washington

• • • A weird and fantastic tale of steel shortages and steel-starved fabricators, of wheels within wheels, and everybody (vest-pocket brokers, mysterious telephone salesmen, lawyers, dentists—and even alleged gunmen) "trying to get into the act" in order to cash in on the tribulations of both producers and consumers has been unfolding here before the steel subcommittee of the Senate Small Business Committee.

This astonishing account of transactions involving such a "daisy chain" of participants that buyers of \$250 a ton steel seldom actually knew from whom they bought the material has startled the senate committee, to say the least.

As this hearing into the ramifications of the so-called "gray market" in steel progresses, the belief is increasing here that it may result in wide repercussion throughout the industry although witnesses as a rule have been specific in declaring their belief that the basic steel producers as an industry cannot be held accountable after shipments leave the mills except possibly through closer scanning of distribution and perhaps revisions of their quotas.

It has been learned by THE IRON AGE, however, that the present strategy of the Senate group calls for eventual summoning representatives of the steel industry, along with some warehousemen.

It is reported that in talking with a steel company official before the hearing began, a committee member was given to understand that the industry felt that the scope of the gray market was too small to be regarded as of major importance and that little could be expected to develop through a hearing. This in no way dampened the Senate group's determination to go ahead.

Chief sufferers and complainants are concerns that had no established steel sources during the base period of 1939-41 (on which the industry bases its voluntary quotas) when steel was plentiful and those which sprung up during the war and have since converted

One Broker Says He Retired When "Daisy Chain" Cut Profit to \$10 a Ton

By KARL RANNELLS
Washington Bureau

to peacetime production requiring steel but find themselves with facilities and no raw material.

In the words of one witness, their "inventories are now entirely depleted and we cannot get steel shipments from the mills. They tell us they feel obligated to first take care of their customers of the base period. It is necessary for us to go into the open market and buy steel at two and three times the mill prices."

In several instances witnesses have said that they have received small mill shipments from time to time but that these are so widely separated as to have no effect on the fabricator's overall requirements.

Even the subcommittee has run up against the elusiveness of some of those involved in the transactions now under scrutiny. In one instance, a process server found an address to be a vacant lot although a mailing address only was later discovered about 10 blocks distant; on another occasion, while the subcommittee was attempting to locate and serve another, the person sought even then was making an offering of a large quantity of steel to a second witness who was subpoenaed for the following day.

This story of premium price sales has been told by a long line of witnesses, including H. F. Kutz, president of the St. Louis Boiler & Equipment Co.; John V. Quarles, manager of Stangard-Dickerson Co., Newark; M. W. Ziegler, president of Krieger Steel Sections, Inc., Long Island City, N. Y.; M. J. Kohnstamm, purchasing agent for Morrison Metal Products Co., Buffalo; E. A. Kerschbaumer, of Han-

non & Kerschbaumer, Pittsburgh brokers, and their N. Y. attorney, Charles Margiotti.

Stangard representatives testified that they had bought 50 tons of steel from Mr. Kutz at \$240 a ton after contacting him through a newspaper ad; they said the steel was in a car at Hoboken, packaged for export.

Mr. Kutz explained that he had entered the brokerage business (first handling metal pipe and related items for clients in the oil industry but including steel at the request of other clients while waiting for necessary equipment to operate a \$50,000 boiler-making business he and two friends had organized. The Stangard steel, he said, was part of a 250-ton purchase he had made from the exporting firm of David L. Wilkoff Co. of Pittsburgh for the purpose of reselling to a refrigerator factory in New York—which turned it down on the grounds that it did not meet specifications. Kutz said he understood that it had been rolled from ingots supplied to the mills by the Wilkoff firm. Mr. Kutz, slightly bewildered by it all, said he retired from the steel brokerage business when he found that after paying his own expenses, commissions to the "daisy chain" of assistants, freight charges, demurrage, etc., he had netted his firm less than \$10 a ton.

Mr. Kerschbaumer related to the subcommittee how an agent whom he knew as Herbert M. Karp, of New York, had offered to sell him approximately 240,000 tons of steel if he would pay an over-ride of \$62.50 a ton and provided he could establish sufficient financial credit for the transaction. He was told the steel would be furnished by a company which produces special steel and has a capacity of only a small fraction of the tonnage mentioned in the deal.

However, Mr. Kerschbaumer said, he never got the steel. Mr. Karp then showed him a letter, signed by an A. R. Zapp, stating the company "regretted" it could not furnish the steel. The company has disclaimed authenticity of the letter.

In the meantime, Kerschbaumer

said, his proposed big steel purchase had become noised about and he then was visited in his New York hotel room by James Boyle who was accompanied by two men who, he believed, were "gunmen" and who demanded steel "or else."

Mr. Karp entered the picture again in connection with Mr. Nagle, who said, through an interpreter, that Karp had offered him 195,000 tons of steel over the next two or three years, the South American to pay an "engineering service" of \$27 a ton. This offer was made about the time Kerschbaumer was on the witness stand.

Mr. Nagle said he represents Argentine and Chilean interests which are trying to obtain 100,000 tons of steel from the United States. He said he had not bought, nor did he intend to buy, any goods for which there was not a legal license or other authorization for export by the proper officials of the United States.

In answer to a charge that he had sold rated steel, Mr. Ziegler said he had begun disposal of wrong-sized shapes which had been allocated to him for construction of metal houses for which he had been promised a guaranteed market contract by Wilson W. Wyatt. When the contractor did not come through as expected (it arrived in May), he explained, sale of the material he could not use was necessary to obtain working capital to keep his

business going. He stopped the sales when notified by CPA that he could not legally do so, he said.

Supplier Strike May Close Down Rouge As Ford Withstands FAA

Detroit

••• A strike at Murray Body Corp., Detroit, large Ford supplier may bring Ford production at the Rouge to a halt at a time when it appeared that the foreman's strike would fail to accomplish the same result.

At the end of the second day Ford production in most classifications not hit by the Murray shutdown was actually higher than before the strike was called by the Foreman's Assn. of America.

Contrary to predictions by an FAA spokesman that steel output would be stopped by the FAA walkout, steel production has actually increased slightly as compared with the previous week.

On the first day of the strike about 63 out of 1800 regularly employed foremen reported for duty at the Rouge. At Highland Park 22 out of 231 foremen reported for work.

Absenteeism of employees other than members of FAA was normal. Foremen were continuing to work at outlying Ford plants.

Gates of the Rouge plant have been kept open and pickets were active at only the main entrance. AFL drivers have refused to unload trucks at the Rouge plant but trucks operated by Ford and those driven by CIO workers were operating.

Truck deliveries at the Rouge have fallen off more than 50 pct since the strike was called and this decline and the progress toward a settlement of the Murray shutdown were being carefully watched by Ford officials.

Murray Body Corp. supplies body panels for Ford coupes and cabriolets as well as frames for the Mercury and the Ford 1-ton truck. Murray also supplies Mercury front end assemblies. The Mercury line has already been forced to close down because of the Murray tie-up.

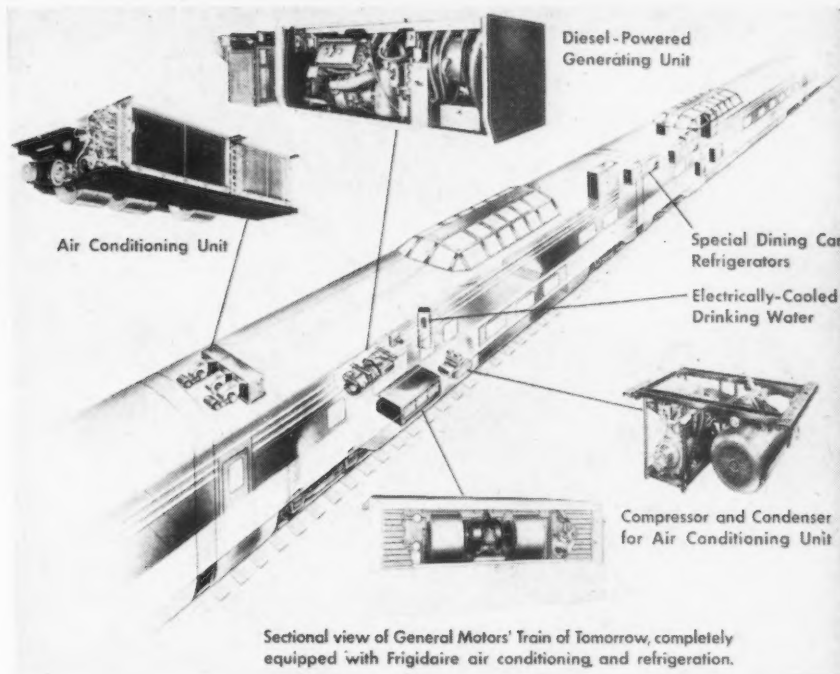
Except for the Murray threat and the cut in freight deliveries most observers here were willing to predict that Ford could keep going without its foremen. While FAA spokesmen had made a point of emphasizing the paralysis that would hit Ford within a few days after calling the strike, the union threat had thus far failed to materialize. Meanwhile, there were indications that the Ford foremen may have placed a highly inflated value on their services at the Rouge.

FULL HOUSE: Members of steelworker's families were guests at South Chicago and Gary Works of U. S. Steel Corp. May 14 and 15, when the corporation held open house for 56,000 at two of its largest mills. More than 1,200 guides worked hard at the job of giving their visitors an opportunity to see openhearth, bessemers and rolling mills in action. Shown in the photograph is part of the huge crowd on the charging floor at No. 3 South Chicago.



Train of Tomorrow Incorporates Maximum In Comfort, Safety

Each Car in GMC Train
Features Astra Dome
And Power Package



Sectional view of General Motors' Train of Tomorrow, completely equipped with Frigidaire air conditioning and refrigeration.

Chicago

General Motors Corp.'s Train of Tomorrow was unveiled this week at Soldiers Field. Representing ultra modern features in design, materials, comfort and style, the train is the result of the entire effort of the corporation to make a spur-of-the-moment idea come true. The four cars of the train were built by Pullman-Standard Car Mfg. Co. The diesel locomotive unit is the standard late model engine previously developed by the Electro-Motive Div. of GMC. The rest of the train, however, is a radical departure from ordinary equipment.

Aside from the eye appeal of the Astra Dome in each car and the wide use of plastic material in interior decoration, every coach has its own "power package." Air conditioning, heating, ventilation, lighting and refrigeration systems are run from the separate diesel generating unit. The "power package" is designed for continuous operation, permitting the car to be uncoupled and still be self sufficient in electrical power.

The entire power unit is supported by synthetic rubber mounting and is enclosed in an air conditioned, dust proofed compartment located below the floor of the car. A unit requiring shop repair can be removed and the replacement unit installed in less than 1 hr. The diesel engine is controlled

by a magnetic throttle and by a governor which maintains a speed of 1200 rpm. Only standard devices regularly used by railroads are included among the control equipment. Complicated controls, heretofore with ac equipment, have been eliminated.

Numerous advantages are claimed in the "power package" system developed by GMC. There is a significant load reduction for the locomotive with the elimination of constant drag of axle driven generators. Compared with the axle driven equipment, these units save as much as 600 hp (engine load) on a 12 car train permitting faster acceleration and longer trains. The weight of the storage battery has been reduced approximately 3500 lb per car.

The smooth riding qualities of the cars are accomplished by the use of outside swing hangers. Electro-Motive originated this type of hanger more than a decade ago and incorporated it into its locomotive trucks. The Train of Tomorrow is the first train in which this design has been included in the locomotive and passenger cars alike.

Swing hangers are U-shaped loops of forged steel, suspended from opposite sides of the upper part of the truck frame. They provide a cradle for coil springs which carry the weight of the car. The outstanding difference be-

tween standard truck design and that employed throughout the Train of Tomorrow is the location of the swing hangers. The hangers on the standard railroad trucks are inside of the frame, whereas Electro-Motive placed them outside the frame.

With outside hangers, the coach rests in effect upon a much wider spring platform than is possible with inside hangers. The distance between the lower end of the outside hangers is 96 in.; between inside hangers only 56 in. Outside hangers provide greatly increased resistance to dangerous side sway. They also contribute passenger comfort by increasing the ability of the trucks to dampen out shocks resulting from imperfect track alinement, rough roadbeds and similar conditions.

On the press preview trip which went from Chicago to French Lick, Ind., on May 26, relief of side thrust on the curves was noticed by most of the passengers. This added comfort is due to the outside hanger which enables the train to bank itself automatically both to the degree of the curve and the speed at which the train travels.

The double deck construction which was necessary to permit the Astra Dome had to be kept within standard top clearance of the roadbed. Such construction was a feat in itself as the operating

stresses of high speed travel had to be handled by the underframe instead of the customary center sill of conventional cars. Wide use of fluorescent lighting and individual directed seat lights for reading are standard equipment.

Telephones include intercar phone service and also radio phone service in transit or "train-to-anywhere" connection. The train is no faster than the standard streamliners of the past. Many new safety features have

been incorporated into the Train of Tomorrow and the brakes are of all electric design and include wheel slide control.

The steel and glass exterior is finished in blue and silver the full length of the 411 ft train. The passenger capacity of 216 people are assured of maximum comfort, safety and attractive surroundings. The unit will be opened for public inspection in Chicago at Soldiers Field from May 29 to June 1, inclusive.

Kaiser Presents Plan For Reducing Debt On Fontana Steel Plant

Washington

• • • Henry J. Kaiser proposed on May 21 to the RFC that the government wash out \$85,329,544 of the debt of the Fontana steel mill to the Federal Government. In lieu of the total of \$123,305,000 in original loans Mr. Kaiser, with the backing of the Western Steel Council, proposed that his company settle all of its outstanding debts by payment of \$20,123,016. This with the \$17,852,840 payments already made on the principal of the original loans would leave the capitalization of the Fontana plant at \$37,975,856.

Of the remaining \$20,123,016, which the new plan filed with RFC proposes, \$15 million would be paid out of Kaiser's shipyard wartime profit and the remaining \$5 million would be raised by private or public financing.

The new capital structure as

outlined by Mr. Kaiser would consist of \$19,707,897 against the \$94,296,158 expended in building the Fontana plant; \$5,781,707 against wartime working capital advances by RFC of \$16,522,590 and \$11,500,000 loans for financing postwar facilities. From this total of \$37,975,856 the Kaiser Co. deducts \$17,852,840 repaid RFC, leaving a proposed debt to the government of \$20,123,016. The three credits the company asked that RFC aggregate \$85,329,544, divided as follows: (1) Credit for "excessive" wartime costs under the Geneva steel plant formula, \$74,588,261; (2) credit for interests paid by Kaiser, \$9,383,088, and (3) credit for wartime operating losses of \$1,358,195.

Requests for these credits were subject of considerable comment in Washington in view of information previously furnished a Congressional Committee that the Kaiser Co. had taken these sums into account in its claims for tax exemption of shipbuilding profits due to losses and depreciation in

the operations of Fontana.

A long statement widely publicized last Thursday morning claimed that the new refinancing formula proposed for Fontana was based on the sale of the government-owned Geneva steel plant in Utah to the U. S. Steel Corp.

In testimony last fall before the House Merchant Marine Committee, Mr. Kaiser said that he asked the government to build the plant for him; that the government had refused and that then he had asked the government to lend him the money so he could build the steel plant. As security for these loans he hypothecated his shipbuilding profits which are now estimated at \$44 million.

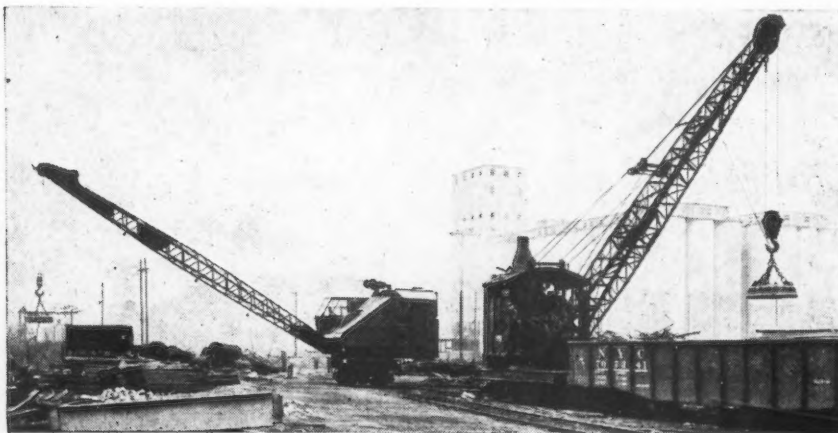
Kenneth Norris, chairman of the steel committee of the Western States Steel Council and president of the Norris Stamping Co., Los Angeles, and Morris Pendleton, president of the Plomb Tool Co., Los Angeles and New York, came to Washington to confer with government officials. They have urged RFC to accept the Kaiser plan.

The Western Council said the objective is to place Fontana on as equitable a basis as that accorded U. S. Steel in its purchase of the Geneva plant at approximately 20 pct of its wartime cost. It was contended that Fontana has proved it can produce steel ingots as cheaply as eastern steel producing areas.

The Kaiser Co. told RFC adjustment of the Fontana loan under the terms of its proposal will have the following results:

- (1) Establish competitive equity with other privately owned or formerly government-owned western mills and eliminate an inconsistent government policy with regard to war plants.
 - (2) Enable us to obtain additional financing and contribute a new supply of finished steel to the national economy at a time when this basic product is vitally needed.
 - (3) Make possible substantial savings for western steel users.
- RFC Chairman John F. Goodloe, commenting on reports that the plan would be rejected, told THE IRON AGE that it is too soon to say what action will be taken. He said that it is being analyzed by examiners but that it has not been even considered by the RFC Board.

NO PLUG-IN: To step up the speed of the McMyler-Interstate railroad crane (left) and avoid having to plug in electrical connections, the Texas Steel Co., Ft. Worth, removed its old electric motors and installed a 150-hp Cummins diesel engine. Track and hook speeds were both stepped up.



Weekly Gallup Polls . . .

Opposition Party Gaining Popularity in Britain

Princeton, N. J.

• • • Britain's Conservative Party, decisively beaten in the elections 2 years ago when the Churchill government fell, has shown a substantial growth of popularity in recent weeks, according to George Gallup, director, American Institute of Public Opinion.

Today it runs neck-and-neck with the Labor Party in popular support. The chief cause of the Conservative gain has been public dissatisfaction with the government's handling of shortages and of prices.

The changed political situation in Britain is seen in the following polls by the British Institute of Public Opinion, showing the trend since the 1945 general election.

"If an election were held today, how would you vote?"

	1945 Elec- tion	May 1946	Jan. 1947	Today
	Pct	Pct	Pct	Pct
Labor	49	45	44	44
Conservative	39	39	41	44
Liberal	9	13	12	10
Other	3	3	3	2

In the latest survey a total of 13 pct—or one person in every eight—expressed no choice.

In the 1945 election the victory of the socialistic Labor Party was to a considerable extent due to the support given it by voters who were not socialists but who felt that this was a party which could get things done, a party which would be able to furnish the people with such sorely needed things as food, fuel, housing and clothing.

Now, 2 years later, many of these same voters feel that the government of Clement Attlee has failed to live up to its promises or to implement successfully its policies. Specifically there are complaints over lack of satisfactory action to supply fuel and food at reasonable prices. Also, many Britishers are dissatisfied with the progress of the housing program.

The dissatisfaction does not mean, however, that the Labor

government is likely to fall anytime soon. There are no signs of any split in the ranks of the Labor Party members in Parliament that would cause an electoral crisis. A vote of confidence would result in an overwhelming majority to sustain the government. The Labor members are not likely to precipitate a split within their ranks because according to observers here, they fear that if the Labor Party were to lose control of the government it might be many years before the party could return to office. The next general election in England is not until 1950. Barring some unforeseen crisis, the Labor Party is expected to maintain itself in office at least until then.

So far as public opinion is concerned, the problem which the Labor government faces is a loss of support on the right, because those Britishers who are conservative-minded consider it too socialistic, while at the same time the Labor Party is losing strength on the left because liberals and left-wingers think it is not socialistic enough.

However, political leaders feel that the leftist voters will stick with the Labor Party because they have nowhere else to go; whereas the more conservative voters can be held only if the party is able to show tangible results for its policies; that is, to provide the people with the things they want.

There is a parallel between the political situation in Britain and the United States in the sense that the two leading parties in each country are evenly divided in popular strength.

The British people's dissatisfaction with the food situation finds active expression against the Food Minister, John Strachey. A recent poll by the British Institute finds the majority of British voters saying they think Strachey has done a poor job so far.

• • • The U. S. public's reaction after the elections last November

Only Slight Majority in U. S. Say They Think Republicans Will Win the Coming Election

o o o

was to sign over the 1948 elections to the Republicans.

Today, the story is a little different.

A poll across the nation during recent days finds voter confidence in a Republican victory in 1948 has slipped substantially.

A majority still say it will be the Republicans who will win in November 1948, but that majority is now only 53 pct, as contrasted to 79 pct last December.

Even Republican voters themselves are not now so optimistic as they were.

Right after the 1946 elections, 99 Republicans out of every 100 with opinions said the GOP was slated to win the presidency in 1948. Today the figure stands at 86 pct.

Democratic hopes have, on the other hand, bounded back strongly. Right after the 1946 elections, three out of every four Democrats with an opinion gave the nod to the opposition for 1948.

Today, 60 pct of them say their own party is going to win. This marks a tremendous reversal, and indicates the extent to which Democratic voter morale has risen in the months since November.

As in the last check, right after the November elections, the institute today had field reporters in all parts of the country ask:

"Regardless of how you, yourself, feel, which party do you think will win the presidential election in 1948?"

Today	Pct
Think Democrats will win	30
Think GOP will win	53
Undecided	17
Last December	Pct
Think Democrats will win	9
Think GOP will win	79
Undecided	12

(CONTINUED ON PAGE 142)

Appeal of Ellwood City To National Tube Co., Believed "Too Late"

Ellwood City, Pa.

••• Despite the recent rejuvenation of hope that National Tube Co. would not close its plant at Ellwood City, based upon the meeting of a Citizen's Committee with B. F. Fairless, president of U. S. Steel Corp., informed sources feel that the action taken was too late. The committee, composed mainly of labor officials from Ellwood City, appealed to Mr. Fairless to reconsider the National Tube Co.'s plan to move from Ellwood City to Gary, and Mr. Fairless indicated that a restudy would be made of the decision. Mr. Fairless is expected to visit the Ellwood City plant soon.

The city, facing the prospect of becoming another industrial ghost town, organized the Ellwood City Industrial Corp., incorporated for \$250,000 which was exacted from business and professional people in the town. In addition, agreements were arranged with various financial agencies to underwrite mortgages to the extent of two-thirds of total cost for any new construction or renovation.

Since August 1946 the Industrial Corp. has succeeded in at-

tracting 10 new companies to the locality. These are: Morris Coupling & Clamp Co., Pittsburgh; Dust Proof Mattress Cover Co., Pittsburgh; Campus Sweater Co., Cleveland; Diesel Parts Co., Pittsburgh; Standard Neon Co., New Brighton, Pa.; Metal Treating Corp., Pittsburgh; Electro Bond Steel Co., New Castle; Calgon Div. of Hagan Corp., Pittsburgh; and National Plumbing & Fixture Co., New York. Already five plant sites have been built or renovated for these new companies. Contractors in the area have agreed to handle such construction on a cost basis, thus posing no problems in obtaining mortgage money from the banks.

The loss of National Tube Co. from the area means about 3850

people will be unemployed. Of this number, however, only about 2400 are from Ellwood City. The companies that are coming into the area are expected to reach an immediate peak employment of about 1400.

Under consideration, with final word expected this week, are the decisions of two major industrial companies as to whether they will or will not move into Ellwood City. One of these companies is a potential tenant for the plant of National Tube Co., and it is expected that National Tube will cooperate in making its buildings available if the company should decide to come in. Should these firms put plants in Ellwood City, the unemployment slack will just about be taken up.

To Sell Brass Casting Furnace and Rolling Mill

Chicago

••• A brass casting furnace and rolling mill operated by Revere Copper & Brass Co. during the war is being offered for sale or lease by the WAA in Chicago. Built at the cost of \$11,500,000, the surplus plant, only 8 miles from the Loop district, is suitable for various types of manufacture. The total floor area is 376,720 sq ft. The plant adjoins paved

streets leading to arterial highways, and has siding connections with the Milwaukee Road, with an incoming capacity for six cars. It is 11 miles from Lake Michigan docks and 10 miles from the Municipal Airport.

The machinery and equipment include facilities for complete production from basic metals, primarily for casting and rolling brass products. A replacement of a small percentage of special machinery would permit production of other commodities. Bids for the purchase or lease of the property will be received in the WAA real property office, 327 S. LaSalle St., up until 2 o'clock of the afternoon of June 30. The Chicago regional office will also arrange for plant inspection. The offer also provides for credit terms and purchase by "small business" firms through RFC priority.

Electric Motors for Sale

Chicago

••• On May 21, more than \$138,000 worth of government surplus electric motors and generators were offered for sale. The list includes frequency changers and rectifiers, and practically all equipment being offered on a first come first served basis is listed in catalog form. Catalogs will be available by the end of May at the WAA customer service centers, 404 S. Wabash Ave., Chicago, and 4574 North Port Washington Road, Milwaukee.



NO ROOM FOR EXPANSION:

The famed Mormon Tabernacle in Salt Lake City gets its third roof in 80 years as 20-gage aluminum replaces iron roofing which served 47 years. Original wooden shingles put on in 1867 were replaced by the galvanized metal in 1900. The contractor reports the removed sheeting was in good shape but no provision for expansion and contraction had been made.

Steel Warehousemen Told to Expect More Business in Coming Year

Los Angeles

• • • In spite of shortages of some products, steel warehouses on an overall basis have fared very well during the past year and can anticipate even more business in the coming year, according to Walter S. Doxsey, president, American Steel Warehouse Assn., Inc., when he addressed members in attendance at the 38th annual meeting here recently.

Comparing figures of 1940 and 1946, Mr. Doxsey pointed out that tonnage wise, shipments to warehouses have increased 30 pct with 8,738,750 tons shipped in 1946 as compared to the 6,686,534 tons shipped to warehouses in 1940.

Approximately 500 members and guests registered for this 4-day conference. More than 400 steel warehouses are now members with 24 chapters throughout the country.

Discussing the stability of warehouse prices during the war and during the post-war months, Mr. Doxsey said:

"While maintenance—by any individual company—of prices with minimum fluctuation may be very well from the standpoint of customer relations, this happy condition cannot be sustained indefinitely. Without exception, all the basic factors upon which warehouse prices are predicated have been disturbed — increased — by post-war economic adjustments."

"Labor costs have more than doubled. Cutting costs are outrunning revenues received. Delivery charges show similar advances. Overhead costs have jumped right along with the others. Mill base prices have been increased.

"Of even greater consequence, additions of new mill extras and the pyramiding of old ones have imposed their strains upon long established principles of warehouse pricing. In the first place, with few modern exceptions, warehouse spreads in dollars per ton remain about the same as they were before the war and in the '30's. The cost of steel has jumped considerably through these base price increases and increases in extras; hence, the percentage of profit enjoyed by warehouses has been reduced. Secondly, some of the new

Shipments Up 30 Pct Over '40; Turnover Zooms but Profit Percentages Are Off

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extras cannot very well be passed along to customers, as was generally done in the past, and still others must be paid and absorbed on some items and not on others and by some warehouses and not by others. Examples of the latter are mill charges for small items.

"This discussion is not intended to be adversely critical of mill prices or pricing policy. The simple fact is that the producers have made these changes which have, in turn, given the warehouses some pretty tough nuts to crack.

"These pricing problems cannot be solved satisfactorily without considering at the same time the character of your business when supply catches up with demand or when the frequently forecast recession develops.

"The War Production Board took the volume of business you did in the first quarter of 1941 as a standard for your quota. In this pre-war quota, warehouse sales hit an all time peak. On the whole, steel distributors are doing from 30 to 40 pct more today than they did during that period and some are going along at much higher rates.

"Before the war, a turnover of 1½ times a year for a warehouse was considered about average, with specialties turning three to four times. One of our members told me that his company moved many thousands of tons of general products last year, with an inventory turnover of 20 and a fraction percent. That may be some kind of a record, but it is true that the turnover time for much of the steel sold by warehouses under present conditions is the time it takes to unload it from a gondola onto a truck.

"The average size of your order is much larger than ever before.

"Without these large volumes, rapid turnovers and bigger individual orders, you probably would be bankrupt.

"You are confronted, therefore, with the intricate task of adjusting your business to vastly increased labor costs and perplexing changes in mill prices and extras.

Reese H. Taylor, president, Union Oil Co., told the delegates what his company was doing to sell America on the facts of business operation and the threat it faces in socialization.

Mr. Taylor's previous experience in the steel business as president of Consolidated Steel Corp. and his work with WPB enabled him to speak understandingly about the problems warehouse operators face today.

William M Jeffers, vice chairman, Union Pacific R. R., addressed the convention on the subject of "Labor Relations—Where Do We Go?" Outspoken in his denunciation of government interference in labor matters and of the radicalism and socialism advocated in many quarters, Mr. Jeffers made a strong plea for the education of youth in the American system of enterprise and the basic concepts of our constitutional form of government.

New Officers

Los Angeles

• • • Walter S. Doxsey was re-elected president, American Steel Warehouse Assn., at the annual meeting here recently. He will also serve as secretary of the association.

A. W. Herron, Jr., Jones & Laughlin Steel Corp., Pittsburgh. and J. J. Hill, Jr., Hill-Chase & Co., Philadelphia, were elected vice-presidents. F. C. Flosi, A. M. Castle & Co., Chicago, was elected treasurer.

In addition to these four officers, the following directors were chosen to serve on the executive committee for the coming year: Lester Brion, Peter A. Frasse & Co., New York; H. V. Douglas, Central Steel & Wire Co., Chicago; P. O. Grammer, Grammer, Dempsey & Hudson, Newark, N. J.; E. D. Graff, Jos. T. Ryerson & Son, Inc., Chicago; Earle M. Jorgensen, E. M. Jorgensen Co., Los Angeles; F. H. Lovejoy, Wheelock, Lovejoy & Co., Cambridge, Mass.; Frank Pidgeon, Pidgeon-Thomas Iron Co., Memphis, Tenn.; George L. Stewart, Edgar T. Ward's Sons Co., Pittsburgh, and L. B. Worthington, U. S. Steel Supply Co., Chicago.

A-L's Withdrawal Of Dunkirk War Plant Bid Leaves WAA Stranded

Pittsburgh

••• When Allegheny Ludlum Steel Corp. withdrew its \$1¼ million bid on May 1 for the government-owned Brigham Road Plant at Dunkirk, N. Y., War Assets Administration lost its one big opportunity of disposing of the plant at a fair price. Built at a cost of \$4,638,000 during the war for the production of bullet core steel, aside from the three rolling mills the plant has little worth other than its real estate and building values.

Under the terms of the DPC contract, Allegheny Ludlum had the option of buying it at a stipulated "depreciated value" within 90 days after it was declared surplus. This the company declined to do, holding that it was in excess of fair value and that not enough of the plant equipment was convertible to peacetime use. The contract also provided for the company, within the second 90 days after the plant was declared surplus, to meet any bid that might be made for the plant by anyone else. There were no bids.

At WAA's urgency, the company surveyed the plant and equipment and on Oct. 3, 1946, made an offer of \$1¼ million for that portion of the plant and equipment appli-

cable to peacetime use. WAA reported at that time that several higher bids had been received. However, WAA soon afterwards announced that sealed bids would be taken for the plant on Mar. 3, 1947. When these bids were opened, Allegheny Ludlum's \$1¼ million offer still topped them all, as did its alternate offer of \$600,000 for several of the hot mills, the 14-in., and the 10 and 8-in. mills and auxiliary equipment.

Three other bids were made on Mar. 3. Dickson Weatherproof Nail Co. offered \$780,000 for the plant and equipment; Pacific Atlantic Steel Co., Los Angeles, bid \$400,000 for the plant and equipment; and Kaiser Co., Inc., offered \$110,000 for the 18-in. mill. Pacific Atlantic Steel Co. wanted the plant for producing rods and barbed wire, and Kaiser's bid was for the 18-in. mill loaded into freight cars for shipment to the West Coast.

WAA referred the bids to W. A. Hauck, chief of the iron and steel branch, Industrial Division, Office of Real Property, Washington, D. C., at which time WAA indicated an announcement of the disposal of the plant would be made. When on Apr. 21, 1947, no decision had been made on the disposal of the Brigham Road plant, Hiland G. Batcheller, president of Allegheny Ludlum, was instructed by the company's board of directors to withdraw the bid, effective Apr. 30, 1947.

To Try Again

Pittsburgh

••• The War Assets Administration announced May 19 that it had rejected all bids for the Brigham Road plant at Dunkirk, N. Y., because they were inadequate. WAA is preparing to re-advertise for new bids, which will close in about 60 days. WAA evaluation of the plant is \$2,114,300. Original reported cost of \$4,638,000 is divided: \$293,000 land and buildings and \$3,345,000 machinery and equipment.

Dunkirk city officials and civic interests are concerned about disposal of the plant because of its effect on the community. The plant has not been operated since December 1945, but is being maintained by the Duffy Construction Co., New York City, at a cost of about \$2000 a month.

Mr. Batcheller stated that regardless of the outcome of negotiations for the Brigham Road plant, which is adjacent to Allegheny Ludlum's Dunkirk plant, the company intends to proceed with its plan for developing the Dunkirk plant as a tool steel center. A part of the Brigham Road plant, obviously, could be utilized in this expansion program, and some of its equipment would eliminate a long wait by the company in procuring new machinery. Now, since WAA has been so slow about disposing of the plant, the company is said to be investigating the possibility of obtaining new facilities from another source. They would, it is reported, be more modern and superior to those that are in the Brigham Road plant.

Coming Events

- June 2-4 American Gear Manufacturers, Hot Springs, Va.
- June 5-7 Electric Metal Makers Guild, Inc., annual meeting, Pittsburgh.
- June 9-11 American Coke & Chemical Institute, annual meeting, French Lick, Ind.
- June 15-19 American Society of Mechanical Engineers, semiannual meeting, Chicago.
- June 16-20 American Society for Testing Materials, annual meeting, Atlantic City, N. J.
- June 17-19 Machinery Dealers National Assn., convention, Cincinnati.
- June 23-27 American Electroplaters Society, industrial finishing show, Detroit.
- June 23-28 Railway Supply Manufacturers' Assn., Atlantic City, N. J.
- July 14-18 American Society of Civil Engineers, Duluth, Minn.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, Inc., Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Chicago.
- Sept. 29-Oct. 3 American Gas Assn., San Francisco.
- Oct. 31 Illinois Mining Institute, annual meeting, Springfield, Ill.

Asks Change in Procedure

Washington

••• Recommendations for a change in the methods of issuing bids on government construction contracts in order to prevent possible discrimination against small contractors in erection of federal structures have been made by the Steel Subcommittee of the Senate Small Business Committee.

Under the recommendation, it would be mandatory for a firm to submit separate bids for furnishing, fabricating and erecting structural steel in order to qualify for combination bidding. At present, separate bidding for the three services is discretionary.

The London **ECONOMIST**

The Tobacco Standard

IT is certainly too early to attempt any complete evaluation of the changes introduced into European economic affairs by the system of exchange that may for convenience be termed the tobacco standard, but at least it is a suitable occasion at which to comment on its existence and on its implications.

The £50 million that Britain pays each year to the United States for tobacco, and the £60 million that Britain has lost in occupied Europe through failure to understand the working of the system in its initial stages are expensive tuition fees—viciously expensive if the lessons are not learned.

The economic historian of the future will probably regard the period between the two wars as a time when mankind groped hesitantly for a new international currency. The precious metals had failed.

For gold, the ritual remained. At the cost of considerable effort in money and labor, gold was laboriously extracted from the rocks of South Africa, refined, shipped to the United States of America and there re-interred, this time in circumstances that demand an additional economic wastage in the shape of armed guards.

In the case of silver, hardly even a pretense was observed. The so-called silver coinage in large areas of the world ceased to contain any valuable content of silver, or of any other metal. It was conveniently simple for a state regime to extract the silver formerly used in its coinage and issue in lieu, at a considerable profit to itself, metal disks without intrinsic value.

The last gold coin of practical use in Britain was the half-sovereign, and those who can remember it will agree that its size was about the smallest that could be tolerated in a coinage in general use. By the end of the 1914 war, coins of gold of the denominations in most general use could no longer be made, even if there had been enough metal available.

Diamonds had some advantages as a currency for large-scale or illicit operations, but there again no coinage could be built up on a substance where the pound sterling would be represented by a stone the size of the head of a pin.

At one time, postage stamps were favored and the historian may devote an interesting footnote on the place of philately in the international monetary system. But the fact remained that for 25 years mankind was compelled to rely on valueless tokens.

THIS was clearly unsatisfactory, if not to the theorists then to the man in the street. The theorists were unable to devise a token coinage, of paper or any other substance, that would have an international acceptance. The man in the street, who needed such a currency far more than the theorists, was unable to find one. The interrelation between this fact and the economic disturbances of that era has yet to be explored in full but it is clear, from the eagerness with which the Tobacco Standard was later adopted, that the two are not disconnected.

Confidence in a currency is not only a matter of exchange rates on an official bourse. The malaise induced in an individual by the possession of paper as his sole token of wealth can result in far-reaching reactions. But, fascinating as the field is, exploration must wait.

The early history of the cigarette currency is obscure and will only be extracted from contemporary records by considerable research in both occupied Europe and in Britain. The cigarette was beginning to establish itself in this new role not later than 1941. From then onwards its development in each area is similar but not identical.

In Britain it never, even at the height of the American occupation, went so far as to replace the existing metal or paper coinages. In occupied Europe it did.

Starting from modest beginnings in Germany and the occupied coun-

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tries, it reached its full flower during 1944 as Europe was liberated. As the armies with seemingly unlimited supplies of cigarettes available behind them replaced those with more meager resources, so did the acceptance of the currency spread. In terms of goods it probably reached its peak value in the second quarter of 1945, although that date was not constant all over Europe.

During the first days of the liberation of Holland, for example, a single cigarette there was equivalent to an English pound, while simultaneously its value in France was perhaps no more than sixpence. Such unfortunate variations are inevitable where the introduction of a new currency is left largely to chance.

WHAT are the peculiarities of the tobacco standard? Perhaps the most outstanding is its self-liquidating quality. In the period before the wars there were many attempts made to attach to the token currencies of the day some device which would make them self-liquidating. The ostensible reason for that was the view then held by many that production and distribution needed some stimulus additional to that provided by the economic machinery of the day. This was accompanied by the belief that the national currency could be made to play some part in this process.

There were, for example, plans for the creation of dollars (the plans were largely confined to the dollar countries) which lost a pro-

(CONTINUED ON PAGE 138)

Chances Called Dim For Moving 80 Million Tons Of Lake Ore in 1947

Cleveland

• • • Consumption of Lake Superior iron ore by U. S. and Canadian blast furnaces during April totaled 6,578,623 gross tons, slightly less than the 6,979,204 tons consumed in March, according to the monthly report of the Lake Superior Iron Ore Assn.

Gross tons of Lake Superior iron ore on hand at furnaces and Lake Erie docks totaled 13,554,803 gross tons May 1, compared with 17,411,010 tons April 1, and 23,078,989 tons May 1, 1946, the report showed.

Active blast furnaces depending principally on Lake Superior iron ore numbered 163 in the U. S. and eight in Canada. Two Canadian and 20 U. S. blast furnaces were idle, the association reported.

According to reliable sources in the iron ore trade, it is not likely that the predicted movement of 80 million tons of iron ore during the 1947 season will be accomplished without extreme difficulty, if at all. Substantial tonnages lost during April because of ice on the lakes cannot be readily made up with the present trip capacity of the Great Lakes fleet.

Before the present season opened, the Weather Bureau's ice expert at Detroit summed up the situation as being comparable to the 1939 season, and as early as Feb. 24, forecast the opening of the Sault with the help of ice-breakers on Apr. 16. He overshot 5 days contrasted with the actual

date on which the first up-bound vessel locked through.

On March 17, the Coast Guard's cutters and the huge ice breaker Mackinaw went into action, working through the jams and solid ice that blocked the connecting channels and opened a passage from the western end of Lake Erie through the Detroit and St. Clair rivers.

On Apr. 2, the L. E. and P. D. Block left Calumet for Escanaba and the E. J. Block headed for Port Inland. On the same day, the Mackinaw led the W. F. White through 2-in. ice into Detour, Mich., with the first coal for the Pickands-Mather dock and the Munson unloaded calcite stone at Toledo.

Carriers continued to feel their way through the shifting ice pack, but stockpiled ore was down to almost 13 million tons and with a required movement of 80 million

tons of iron ore ahead, each passing day made operation of the full fleet more urgent.

On Apr. 8, the Lake Carriers' ice committee dispatched the chartered railroad car ferry Ste. Marie to help the Mackinaw open up the Sault. Finally, after several variations in the weather alternately helped and hindered the job of breaking up the ice, the Sault reached a normal rate of operation on May 6.

Only after the Mackinaw was released from duty at the Sault and began breaking channels through the outer harbor jam on May 9 did the port of Buffalo remain open.

By the time the fleet had gained full scheduled operation, Coast Guard vessels and the Ste. Marie had ploughed a grand total of over 22,300 miles of courses through the ice.

WAA Offers Surplus Metalworking Machines To Aid School Shops

Washington

• • • Extending the list to cover all metalworking equipment except that offered exclusively to veterans, WAA has announced a new program which it says is designed to rehabilitate the vocational shops of the nation's schools. The program covers thousands of items of surplus metalworking machinery which are being offered for sale to nonprofit health and educational institutions at a nominal price of 5 pct of fair value.

This program supplements a

recently-announced plan under which metalworking machinery is made available for donation to eligible institutions if the property remains in surplus inventory after the close of fixed price sales. WAA said that the nominal price offer has the advantage over the give-away program in that it gives the institutions the opportunity to make selections at their priority levels in the early stages of a sale.

Previously the 5 pct nominal price offer to nonprofit institutions covered only a specified list of surplus items, including several hundred types of metalworking machinery but now has been broadened to include all such equipment save that offered exclusively to veterans.

Disposals at the nominal price will be made during all offerings at the appropriate priority level, and eligible buyers will receive advance notice of at least 15 days of the proposed sales. The nominal price of 5 pct will be computed from the fair value of the property or the lowest price at which it is offered to commercial buyers. The 12½ pct dealers' discount will be allowed before the 5 pct nominal price is computed. Sales will be f.o.b. shipping point basis. No handling or other charges will be assessed. Purchase orders should be submitted to the Priority Claimants Division in WAA regional offices.

HEAVY DRUM PERCENTAGE PRODUCTION BY BASIC STEEL FIRMS
(By Region and By Company, 1946)

	Total U. S.	West Coast	St. Louis	Houston	New Orleans	Chicago	Atlanta	Cleveland- Pittsburgh
U. S. Steel	24	51	.....	50	39	29	.....	15
Bethlehem	21	49	.....	22	22	15	42	.....
Jones & Laughlin	16.5	.....	54	23	15.2	.....	35	10
Inland	11.2	.....	.....	.....	22	42	11	.....
Republic	6.4	.....	.....	.....	.....	.....	.....	24
Granite City	6.3	.....	46	.....	.....	.....	7	.....
Wheeling Steel	4.4	.....	.....	.....	.....	.....	.....	17
	89.8	100	100	95	98.2	86	95	66

Above table of percentages of total heavy steel drum production facilities held by basic steel companies, both by company and by geographical region, is based on figures furnished to a Senate Judiciary Subcommittee by Dr. John Blair, assistant chief economist, FTC. Heavy steel drums, as defined by the FTC, include only 19-gage and heavier drums and thus its figures may vary widely from Commerce Dept. statistics which involve a much larger category of steel containers.

(See page 82)

Issues Summary of Present Mineral Wealth in the U. S.

Washington

• • • Domestic supplies of the basic materials used by the steel industry will be adequate for many decades, but indicated supplies of various ferroalloying materials are not as favorable, according to a 325-page report on the "Mineral Position of the United States" submitted by Interior Secretary J. A. Krug to the National Resources Economic Subcommittee of the Senate Public Lands Committee.

This special subcommittee, headed by Sen. George W. Malone, R., Nev., opened hearings last week on a comprehensive investigation of all the factors affecting production, development, utilization and conservation of domestic mineral, fuel, agricultural and forestry resources. Its objective is to create a long-range policy to assure (1) an adequate supply of agricultural and mineral resources sufficient to ward off any conceivable attack by foreign powers, and (2) an ever developing supply of resources which will permit steadily rising standards of living and general prosperity. Senator Malone at the outset of the hearings stated that it was the prerogative of Congress to set such a policy, rather than the Dept. of Interior.

The report submitted by Mr. Krug represents a 5-year effort on the part of the Bureau of Mines and the Geological Survey. Until presented to the subcommittee, it was classified secret. It comprises a factual summary of the present mineral knowledge of the United States and includes 39 commodity chapters, each dealing with a separate mineral. The report was made during the war and most of the estimates on reserves cover the year 1944. However, the report states that it is believed that "if the figures were corrected for early 1947, there would be few, if any, significant changes." It is described as the "first attempt at an overall appraisal of the nation's mineral wealth." Only two copies are available at present, but the subcommittee plans to have it printed as a public document.

The report reveals that "the

Sees Outlook for Steel Good But Deficiencies in Some Industrial Minerals

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United States is by no means a 'have-not' nation in those minerals that are basic to the maintenance of its kind of industrial society. However, its resources are deficient in several important industrial minerals, and the outlook for major improvement in most of these is not favorable. Thus, continued dependence on foreign sources for supplies of these commodities is indicated."

In general, the future outlook for the steel industry is good, according to the report. "Analysis of known commercial reserves in the United States indicates that this country is exceptionally well supplied with coal and reasonably well off in iron ore," continues the report, "so that the nation is not confronted with a scarcity of raw materials that could threaten the basic security of its steel industry. Thus the foundation of its industrial economy is assured for many decades. It is true that known resources of high-grade coking coal are becoming scarce and that the more readily available high-grade iron ores are nearing exhaustion, but there are tremendous lower-grade resources that should offer no insurmountable difficulty to utilization."

The study indicates that this

country is virtually self-sufficient in iron ore and reported that the total of nearly 4 billion tons of measured and indicated ore implies an assured reserve equivalent to 40 years' supply, even at wartime expanded rates of production. It is also believed that virtually all this ore can be mined at prevailing or somewhat higher prices. The total reserves of measured, indicated and "inferred" ores are equivalent to about the total past production.

The accompanying table reveals the detailed findings in regard to iron ore reserves.

The first three categories cover ore that is considered usable under present conditions. Inferred ore is that of which there is little visual evidence, but its occurrence may be reasonably inferred from geologic evidence. Potential ore is that which may become usable in the future, but is in some cases remote. Officials of the Geological Survey stated at the hearings that the inferred reserves quoted in the report may err on the conservative side. It was stated that they are likely to be much nearer the minimum than the maximum.

Compared with 1934-44 annual rates of production and consumption, the survey showed that this country has 78 years' supply of commercial grade iron ore in terms of years of production and 76 years' supply in terms of years of consumption.

Similar data, in greater detail, is contained in the report on the

RESERVES OF IRON ORE IN THE UNITED STATES AS OF JANUARY, 1944,
AND PRODUCTION THROUGH 1943
(millions of long tons)

Region	Lowest Grade of Ore Commonly Mined (Fet of Iron, natural not dried)	Measured and Indicated Ore	Inferred Ore	Potential Ore	Total Production Through 1943
Lake Superior	51.5	1,306	500	61,000	2,076
Southeastern	35	1,561	560	270	325
Northeastern	25	536	390	1,500	163
Western	50	141	275	140	38
Central and Gulf	50	173	25	5	11
Alaska	—	3	5	....	None
Total	—	3,726	1,755	62,195	2,613

¹Data insufficient to separate.

Industrial Briefs . . .

• **TO SELL TWO PLANTS**—Two Akron industrial plants, operated during the war by Goodyear Aircraft Corp. and the Goodyear Synthetic Rubber Corp., are now available for sale or lease to private industry by the War Assets Administration.

Largest of the Goodyear Aircraft buildings is a 710,000 sq ft structure which was operated for the assembly of aircraft parts. Wartime cost of the entire project was \$5,030,757. The Goodyear rubber plant comprises 16 buildings which were used for wartime production of synthetic rubber from styrene and butadiene.

• **AFA ELECTIONS**—K. A. DeLonge has been elected chairman of the Metropolitan Chapter of the American Foundrymen's Assn., to serve during the 1947-48 season. He was previously vice-chairman. Mr. DeLonge is with the Development and Research Div., of the International Nickel Co. Inc., New York.

W. E. Jones, chief engineer, Stockham Pipe Fittings Co., has been elected chairman of the Birmingham Chapter of the association. Dr. James T. MacKenzie, chief metallurgist, American Cast Iron Pipe Co., was elected vice-president, and Fred K. Brown, sales manager, Adams, Rowe & Norman, was reelected to his fifth term as secretary-treasurer.

• **BUYS TOOL FIRM**—The E. W. Buschman Co., Cincinnati, has purchased the Winton Place buildings and real estate of The King Machine Tool Co. The building contains about 65,000 sq ft of floor space, with railroad siding passing through it. Also acquired were 18 electric traveling cranes and machine tools.

• **ANNIVERSARY** — Dietrich Brothers, Inc., Baltimore, is celebrating its fiftieth anniversary. The company was founded in 1896.

• **CONTRACT AGREEMENT**—The Meehanite Metal Corp., New Rochelle, N. Y., has entered into a contract with the Builders Iron Foundry, Providence, R. I., for the manufacture of Meehanite castings.

• **POWER IMPROVEMENTS** — The Pennsylvania Salt Mfg. Co. has announced it now has under construction at its Wyandotte, Mich., plant additional boilers and allied power generating equipment, including a completely new modern power plant building at a cost of more than \$3,500,000.

• **NEW GADSDEN PLANT**—Allis-Chalmers Mfg. Co., Milwaukee, has leased the former government ordnance works at Gadsden, Ala., for the manufacture of tractors and mechanical cotton pickers.

• **NEW MILL MOTOR**—Westinghouse Electric Corp. has announced a new electric mill-motor, used principally in steel mills to raise and lower rolls. An improvement on earlier motors of its kind, the redesigned unit is reduced in size by one third for a given horsepower. The horsepower ranges from 50 to 300.

• **MODERNIZING** — Allied Mills, Inc., Buffalo, has announced an extensive modernization program which is expected to require a year for completion. Plans include erection of 40 steel tanks atop the Buffalo plant, as well as a new warehouse, powerhouse and coal-handling equipment. James Stewart & Co., of Chicago, is the general contractor.

• **PRICE REDUCTION** — Detroit Steel Products Co., producers of steel windows, has wired President Truman that it has voluntarily reduced the list price of residential steel casement windows by 5 pct. The company has also announced the elimination of escalator clauses in all its material contracts.

following minerals: Antimony, arsenic, asbestos, bauxite and other sources of aluminum, bismuth, cadmium, chromite, coal, cobalt, copper, industrial diamonds, fluorspar, gold, graphite, helium, lead, magnesium raw materials, manganese, mercury, mica, molybdenum, natural gas, nickel, nitrates, petroleum, phosphate rock, platinum metals, potash, quartz crystals, salt, silver, sulfur, tantalum, tin, titanium, tungsten, vanadium and zinc.

It is pointed out that the significance of the reserves estimated in the report "must be evaluated in the light of the inadequacy of available information and the potential influence of scientific technological and economic changes on the discovery and exploitation of mineral deposits."

In the course of the hearings, which are expected to cover several weeks, attention will be focused not only upon the direct factors influencing the production and development of natural resources, but also on those indirect factors which have an effect on production and prices of mineral and agricultural products, such as tariffs, quotas, trade agreements, blocked exchanges, and imperial preferences.

Officials of the Interior Dept., familiar with the report, testified at the opening sessions. At that time, Senator Malone made it clear that he believed that government controls, such as those embodied in the tax laws and those governing the sale of securities, were inhibiting the investment of capital in mining ventures.

He indicated that the Committee would study this situation fully and eventually present a series of recommendations.

Other government agencies, including the Army-Navy Munitions Board, State Dept., War Dept., Navy Dept., Commerce Dept., Tariff Commission, and the Justice Dept., have been asked to appear. Leaders in the mining, forestry, fuels, and agricultural industries, together with representatives of the fabricators of such raw materials, will also be invited to testify.

Construction Steel . . .

New York

• • • The estimated total bookings of fabricated structural steel for the month of April 1947, according to reports received by the American Institute of Steel Construction, Inc., amounted to 143,101 tons, slightly less than the bookings of 149,634 tons reported for the previous month. The estimated total bookings for the first 4 months of 1947 amounted to 523,589 tons, or an increase of 19 pct over the average of 439,199 tons booked in the same months in the averaged 5 prewar years 1936 to 1940.

April shipments totaled 138,982 tons, a slight increase over March, and some 12 pct greater than the averaged April shipments in the 5 prewar years. The tonnage available for fabrication at Apr. 30 was 631,636 tons.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1947	Estimated Total Tonnage for the Entire Industry Avg. 1936-1940
Contracts Closed		
January	104,973*	107,578
February	125,881*	96,280
March	149,634*	124,558
April	143,101	110,783
Total	523,589	439,199
Shipments		
January	140,650*	92,578
February	136,126*	88,626
March	137,799*	115,031
April	138,982	123,650
Total	553,557	419,885
Tonnage available for fabrication within the next 4 months	631,636	319,163

• • • Fabricated steel awards this week included the following:

- 4650 Tons, Los Angeles, General Petroleum Corp. office building, through P. J. Walker & Co., to Consolidated Steel Corp., Los Angeles.
- 2300 Tons, Joliet, Ill., addition to Public Service Station, Public Service Co. of Northern Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.
- 2200 Tons, Port Washington, Wis., Unit No. 4 power plant, to Worden Allen Co., Milwaukee.
- 1475 Tons, Houston, overpass Scott and Bernard St., to American Bridge Co., Pittsburgh.
- 1100 Tons, various locations, boiler supports, Babcock & Wilcox Co., Monsanto Chemical Co., to American Bridge Co., Pittsburgh.
- 470 Tons, Sandstone, Minn., bridge, State of Minnesota, to American Bridge Co., Pittsburgh.
- 265 Tons, Aurora, Minn., factory building, Pickands Mater & Co. to Worden Allen Co., Milwaukee.
- 225 Tons, Alberta, Mich., bridge, Sturgeon River, State of Michigan, to American Bridge Co., Pittsburgh.
- 170 Tons, Indianapolis, Ind., swine pavilion, to International Steel Co., Evansville, Ind.

• • • Fabricated steel inquiries this week included the following:

- 4500 Tons, Mississippi River Lock 27, Chain of Rocks Canal, bids due May 28, U. S. District Engineer's office, St. Louis.
- 2300 Tons, Philadelphia, City of Philadelphia, Market St. subway extension, June 18.
- 1850 Tons, South San Francisco, overhead crossings over Southern Pacific tracks, California Div. of Highways, Sacramento, bids to June 18.
- 1500 Tons, Salt Lake City, Utah, fabricating shop for Chicago Bridge & Iron Co., Chicago.
- 1305 Tons, Fort Bragg, Calif., bridge across Noyo River, California Div. of Highways, Sacramento, bids to June 18.
- 850 Tons, Boys Town, Neb., field house, Father Flanagan's boys' home.
- 475 Tons, Billings, Mont., heater exchanger and vessel structure for Carter Oil Co.
- 360 Tons, Oakland, Calif., overcrossing over East Shore Freeway at 29th, California Div. of Highways, Sacramento, bids to June 18.
- 160 Tons, Wyoming County, Pa., route 13, section 3, reconstruction of bridges, Pennsylvania Dept. of Highways, June 6.
- 150 Tons, Wilmington, Del., clubhouse, St. Anthony's Catholic Club, May 29.

• • • Reinforcing bar awards this week included the following:

- 2300 Tons, Philadelphia, sewage disposal plant, City of Philadelphia, through Newport News Engineering Co., Newport News, Va., to Bethlehem Steel Co., Bethlehem.

- 400 Tons, Watertown, Mass., cooler for Quincy Market Cold Storage Co. to Truscon Steel Co., Boston.
- 300 Tons, Beloit, Wis., unit of Wisconsin Power & Light Co. to Ceco Steel Products Co., Omaha, Neb.
- 225 Tons, Marshfield, Wis., sewage plant, Thompson Abbott Construction Co. to Ceco Steel Products Co., Omaha, Neb.
- 150 Tons, Jersey City, N. J., new warehouse building, Pioneer Engineering Corp., to Capitol Steel Corp., New York.
- 150 Tons, Maspeth, N. Y., new warehouse building, Richey, Browne & Donald, to Capitol Steel Corp., New York.

• • • Reinforcing bar inquiries this week included the following:

- 600 Tons, Miles City, Mont., veterans' hospital. Bids close June 6.
- 530 Tons, Butler and Marshall Counties, Iowa, highway paving, Booth & Olson, Inc., Sioux City, Iowa, low bidder.
- 500 Tons, Estes Park, Col., Olympus Dam, Bureau of Reclamation, Denver, Spec. 1825, bids to June 16.
- 425 Tons, Bethany, Calif., Central Valley Project, Bureau of Reclamation, Denver, Inv. E-33,315-A.
- 220 Tons, South San Francisco, overhead crossings over Southern Pacific tracks, California Div. of Highways, Sacramento, bids to June 18.
- 130 Tons, Jenness, Idaho, Bureau of Reclamation, Denver, Inv. B-1157-A-2, bids to May 28.
- 120 Tons, San Francisco, U. S. Treasury Dept. Inv. SF-3944-47.
- 100 Tons, Oakland, Calif., overcrossing over East Shore Freeway at 29th, California Div. of Highways, Sacramento, bids to June 18.

Steel Industry's Quota System Satisfactory To Housing Program

Washington

• • • As a whole, the steel industry's voluntary quota or "allocation" system is working out in a manner "entirely satisfactory" to the housing program insofar as the production of housing materials is concerned, according to Frank R. Creedon, the Housing Expediter.

A possible exception, he added, may be found in the manufacture of steel sash of which there is a scarcity at present. However, it is hoped that this shortage may be overcome soon by the prospect of additional aluminum and lumber for this particular item.

Testifying before a Senate subcommittee recently, Mr. Creedon said that although it is yet too soon to form a definite opinion, on the basis of industry's performance since government allocation control was suspended there is no indication that further government action will be needed to maintain an adequate flow of steel to building material producers.

Metal door manufacturers had

previously testified that their plants were receiving no more than 50 pct of the steel needed to meet their requirements.

While Mr. Creedon said that he had no definite knowledge of such a situation, other sources offered as an explanation of the apparent discrepancy the opinion that this industry could be operating far below its capacity, expanded during wartime, and yet be producing sufficient items for the housing needs.

Aids Short Housing Items

Washington

• • • Representatives of the steel industry have agreed voluntarily to allocate 261,000 tons of steel in the third-quarter of 1947 for those housing items which the Office of the Housing Expediter considers critical, this agency has announced.

That amount of steel will be shipped to producers of plumbing and heating, builders' hardware, wiring devices, window sash and frames, and other critically needed housing items, as well as industrially-made houses, panels and sections.

MACHINE TOOLS

... News and Market Activities

Upward Revision in Machine Tool Price Schedule Expected

• • • Rumors of machine tool price increases were percolating through the trade this week while some producers were reporting the greatest influx of new firm orders in the past two months.

Despite the bullish attitude of some major segments of the machine tool industry, business was still on the spotty side in several important centers, and a few large producers were on record with the prediction that 1947 volume will be no more than 70 pct of 1946 volume.

With definite possibilities of a substantially lower volume for the year already part of the background, and the fact that many segments of the machine tool industry are going to have to pay the general 15¢ per hr wage increase, some upward revision of the price schedule is to be expected.

According to some qualified observers, machine tools are about due for a 15 pct price increase, and the new models being brought out or readied for the Machine Tool Show will provide an ideal opportunity. Wages in the machine tool industry have increased 77 pct since 1939, according to the Bureau of Labor Statistics, which reported the average hourly wage in the industry in 1939 at 75¢ and the same wage in January 1947 at \$1.33. Machine tool prices have increased about 35 pct in most lines since 1939.

While a few customers are holding off for the Machine Tool Show, a number of machine tool makers are going to introduce their new machines before the show. In fact, several companies have their new machines out already, according to reliable sources in the trade. Introduction of the new lines at this time would seem to preclude any possibility of the show causing a lull prior to its opening.

Machine tool shipments and orders in April, according to preliminary figures released by the National Machine Tool Builders Assn., put shipments at \$24,184,-

Lower Volume of Production And General Wage Rise Are Major Factors

• • •

142 and unfilled orders at \$127,570,321. As these preliminary figures suggest, April was a good month for many machine tool builders.

In the East, dealers continue to report the market quiet. They have been working with buyers to establish the economic advantages of new tools, but orders are slow in being placed. Some buyers have started to ask for the modification of standard escalator clauses so as to permit a downward revision of price should the market decline. This is particularly true of tools from builders who are unable to offer better delivery time than a range of 10 to 24 months. Dealers report that shapers are available for immediate delivery, engine lathes in 10 to 12 weeks. Turret lathes are reported to be obtainable for early delivery.

While no new tooling programs have been announced recently by Detroit auto manufacturers, the tool and die industry continues to hope that orders will soon be awarded for tooling that remains to be placed for new model cars. At the moment, tool and die shops are at a standstill and wage negotiations started several weeks ago are continuing. A reported cancellation by Chrysler of a \$20 million order for new tooling, coming on top of last week's announcement of another postponement of the Chevrolet light car program, has proved a double blow to the hopes of many machine tool producers and their representatives in this area.

Machine tool producers continue to find themselves operating under a serious handicap in the face of the great quantity of tools being offered through WAA. However, sizable volume of special equipped

milling machines, lathes and shapers is reported to be on order with backlogs extending in some instances up to 2 yrs.

New orders for perishable tools, such as standard cutting tools and gages, have been light for some time and inventories of local warehouses as well as consumers are reported to be high. It is expected that sales volume to this segment of the market will remain at low levels, for some time to come, despite currently high auto output.

Purchasing agents of several automobile companies have expressed the belief that machine tool producers may be holding up important developments for introduction at the Machine Tool Show in Chicago, but there is no indication that this opinion is widely held.

Deliveries against machine tools already on order are reported as fair to slow, although the materials picture seems, at the moment, to be somewhat brighter than was the case several months ago.

In Cincinnati, the machine tool market shows little, if any, change. A strong demand for lathes and shapers is spearheading the new business, but new firm orders for milling machines and shapers are spotty. Reports from some segments of the industry here indicate that many retooling projects are being held up until the new machine tools which will be introduced at the show can be delivered.

A spokesman for the Joint Army-Navy Machine Tool Committee (JANMAT) told THE IRON AGE that the group has set July 30, 1947, as the tentative date by which the Army and Navy will wind up their program of earmarking machine tools for the strategic reserve against possible future mobilization. Aside from tools in permanent installations, the committee has set a total of 71,000 machine tools as the amount it proposes to acquire from government surplus stocks.

Comparison of Prices . .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(cents per pound)				
Hot-rolled sheets	2.50	2.50	2.50	2.425
Cold-rolled sheets	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip	2.50	2.50	2.50	2.35
Cold-rolled strip	3.20	3.20	3.20	3.05
Plates	2.65	2.65	2.65	2.50
Plates, wrought iron	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	30.30
*24 ga				

Tin and Terneplate:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(dollars per base box)				
Tinplate, standard cokes	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30

Bars and Shapes:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(cents per pound)				
Merchant bars	2.60	2.60	2.60	2.50
Cold-finished bars	3.20	3.20	3.20	3.10
Alloy bars	3.05	3.05	3.05	2.92
Structural shapes	2.50	2.50	2.50	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	24.00
Wrought iron bars	6.15	6.15	6.15	4.76

Wire and Wire Products:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(cents per pound)				
Bright wire	3.30	3.30	3.30	3.05
Wire nails	3.75	3.75	3.75	3.25

Rails:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(dollars per 100 lb)				
Heavy rails	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails	2.85	2.85	2.85	49.18*
*per net ton				

Semifinished Steel:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(dollars per gross ton)				
Rerolling billets	\$42.00	\$42.00	\$42.00	\$39.00
Sheet bars	50.00	50.00	50.00	38.00
Slabs, rerolling	42.00	42.00	42.00	39.00
Forging billets	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43

Wire Rods and Skelp:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(cents per pound)				
Wire rods	2.55	2.55	2.55	2.30
Skelp	2.35	2.35	2.35	2.05

Pig Iron:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(per gross ton)				
No. 2, foundry, Phila.	\$36.51	\$36.51	\$36.51	\$28.34
No. 2, Valley furnace	33.50	33.50	33.50	26.50
No. 2, Southern, Cin'ti	34.75	34.75	34.75	26.94
No. 2, Birmingham	29.88	29.88	29.88	22.88
No. 2, foundry, Chicago†	33.00	33.00	33.00	26.50
Basic, del'd eastern Pa.	36.92	36.92	36.92	27.84
Basic, Valley furnace	33.00	33.00	33.00	26.00
Malleable, Chicago†	33.50	33.50	33.50	26.50
Malleable, Valley	33.50	33.50	33.50	26.50
Charcoal, Chicago	45.99	45.99	45.99	42.34
Ferromanganese†	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
‡ For carlots at seaboard.

Scrap:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(per gross ton)				
Heavy melt'g steel, P'gh.	\$32.25	\$29.75	\$29.75	\$20.00
Heavy melt'g steel, Phila.	29.75	29.50	29.75	18.75
Heavy melt'g steel, Ch'go	29.25	29.25	30.25	18.75
No. 1, hy. comp. sheet, Det.	27.00	26.00	24.75	17.32
Low phos. plate, Youngs'n	35.75	35.75	37.25	22.50
No. 1, cast, Pittsburgh	36.50	37.50	42.50	20.00
No. 1, cast, Philadelphia	41.00	41.00	45.50	20.00
No. 1, cast, Chicago	37.25	37.25	39.50	20.00

Coke, Connellsville:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(per net ton at oven)				
Furnace coke, prompt	\$10.50	\$10.50	\$10.50	\$7.50
Foundry coke, prompt	11.25	11.25	11.25	9.00

Nonferrous Metals:	May 27, 1947	May 20, 1947	Apr. 29, 1947	May 28, 1946
(cents per pound to large buyers)				
Copper, electro., Conn.	23.00	23.00	21.50	12.00
Copper, Lake, Conn.	21.625	21.625	21.625	12.00
Tin, Straits, New York	80.00	80.00	80.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	8.25
Lead, St. Louis	14.80	14.80	14.80	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when the actual data of shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL	
May 27, 1947	2.85664¢ per lb.
One week ago	2.85664¢ per lb.
One month ago	2.85664¢ per lb.
One year ago	2.73011¢ per lb.

HIGH		LOW	
1947	2.85664¢	2.85664¢	
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	2
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	5
1943	2.29176¢	2.29176¢	
1942	2.28249¢	2.28249¢	
1941	2.43078¢	2.43078¢	
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939	2.35367¢ Jan. 3	2.26689¢ May 16	
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	
1933	1.95578¢ Oct. 3	1.75836¢ May 2	
1932	1.99196¢ July 5	1.83901¢ Mar. 1	
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	
1929	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON		SCRAP STEEL	
.....\$33.15 per gross ton.....	.....\$30.42 per gross ton.....		
.....\$33.15 per gross ton.....	.....\$29.50 per gross ton.....		
.....\$33.15 per gross ton.....	.....\$29.92 per gross ton.....		
.....\$26.12 per gross ton.....	.....\$19.17 per gross ton.....		

HIGH		LOW		HIGH		LOW	
\$33.15 Mar. 11	\$30.14 Jan. 7	\$39.67 Mar. 18	\$29.50 May 20				
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1				
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22				
\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24				
23.61	23.61	\$19.17	\$19.17				
23.61	23.61	19.17	19.17				
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10				
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9				
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16				
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7				
23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9				
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8				
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29				
17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25				
16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3				
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5				
15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29				
18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9				
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8				

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

NONFERROUS METALS

... News and Market Activities

Copper

••• Early this week the copper market continued on a multiple price basis with reports indicating that the bulk of the sales are being made below the 24¢ price. Producers report that demand for copper on the part of the brass mills is continuing despite the curtailment of orders on mills. Some brass mills continue to report that they are unable to obtain their copper requirements at 21.50¢. Anaconda Wire & Cable Co. and American Brass Co. have revised their price schedules for fabricated products effective Monday based on a copper price of 23¢ per lb. Although full details are not yet at hand, it is reported that some brass mill products have been increased above the 1½¢ differential. Other mills are reported to be working out new price schedules. Mills report that they are able to obtain adequate supplies of ingot copper but shortages exist in brass cakes and wire bars. One brass mill reports that it has not yet received its copper for June operations. Copper producers are continuing to distribute available tonnage on an allocation basis to established customers. They are unable to take care of new customers who are seeking deliveries.

Zinc

••• Foreign demand for zinc has not been consistently high as in recent weeks and the export price is reported to be 10.25¢ f.a.s. Gulf Ports. Producers are anticipating the opportunity to build up their inventories. Consumers who are requesting deliveries of their monthly tonnage during the first week or two of the month can-

not generally get them and must receive shipments extended throughout the month. Prime Western and Special High Grade are the grades continuing in greatest demand.

Scrap Metals Price Drop

New York

••• Absence of consumer demand for scrap copper and brass, aluminum and high nickel alloys for the past several weeks resulted last week in sharp declines in market prices. Prime grades of copper scrap dropped 2¢ per lb. Declines in aluminum scrap were somewhat less, but some grades of nickel and nickel alloy scrap dropped even more. Detailed prices are reported on the opposite page.

Sell Japanese Lead

Washington

••• U. S. Commercial Co., subsidiary of RFC, has sold on a competitive bid basis 1605 short tons of Japanese soft lead scrap f.o.b. cars at Seattle and Portland, Ore.

An average of 13.355¢ a lb was received for the lot with the highest successful bid running 13.62¢ and the lowest, 13.13¢. Import of the lead scrap was in accordance with arrangements worked out between RFC, the State Dept., War Dept., and the Supreme Commander for the Allied Powers.

The successful bidders were the American Smelting & Refining Co., San Francisco, 735 tons; Bunker Hill Smelter, Kellogg, Idaho, 105 tons; Northwest Lead Co., Seattle, 105 tons; and Schuykill Products Co., Baton Rouge, La., 660 tons.

Lead

••• Some consumers have been disappointed in the inability to obtain lead to the extent forecast by recent market reports indicating a better supply-demand relationship in the metal. Lead is still in short supply but there is a marked change in the market outlook from the critically tight position of only a few months ago. Storage batteries are obtainable with comparative ease now and at relatively low prices. However the supply of lead is not yet sufficient to meet all demands, including what might be considered non-essential uses. This situation may be expected to prevail throughout the summer. It is at considerable variance, however, with the predicted long term shortage of the metal. St. Joseph Lead Co. reports that it will be necessary to close down its Herculaneum furnace near St. Louis because of the lack of concentrates.

Tin

••• Receipt of 50 tons of pig tin from Siam last week marked the first shipment of refined tin from that country. At the end of the war there was something like 15,000 tons of tin in Siam in the form of metal and concentrates. This initial shipment is a portion of the 1300 tons scheduled for shipment to this country during the second quarter under the allocation program of the Combined Tin Committee. Current allocations of tin to U. S. consumers are averaging something over 5000 tons per month. Allocations for June delivery were made last week.

Offer Aluminum Plant

Washington

••• The \$3.5 million Ancor sinter process alumina producing facilities in South Carolina, consisting of a plant in Harleyville and clay mines at Aiken, has been put up for sale or lease by WAA. The processing plant consists of 13 buildings and equipment.

Nonferrous Metals Prices

Cents per pound

	May 21	May 22	May 23	May 24	May 26	May 27
Copper, electro, Conn.	21.50—	21.50—	21.50—	21.50—	21.50—	21.50—
	24.00	24.00	24.00	24.00	24.00	24.00
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

NONFERROUS METALS PRICES

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	27.50
Cadmium, def'd	1.75
Cobalt, 97-99% (per lb)	1.50 to 1.57
Copper, electro, Conn. Valley 21.50 to 24.00	
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	35.00
Indium, 99.8%, dollars per troy oz.	32.25
Iridium, dollars per troy oz.	\$85 to \$95
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%,	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$85.00 to \$87.00
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	24.00
Platinum, dollars per troy oz.	\$59 to \$62
Silver, New York, cents per oz.	70.75
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	\$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.50
No. 120	19.00
No. 123	18.50
90-10-10 ingot	
No. 305	23.50
No. 315	21.75
88-10-2 ingot	
No. 210	23.25
No. 215	27.25
No. 245	21.75
Yellow ingot	
No. 405	15.75
Manganese Bronze	
No. 421	17.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75
0.60 copper, max.	15.50
Piston alloys (No. 122 type)	14.50
No. 12 alum. (No. 2 grade)	14.00
108 alloy	14.25
195 alloy	14.75
AXS-679	14.25
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-97½ pct	14.50
Grade 2—92 pct-95 pct	13.00
Grade 3—90 pct-92 pct	12.25
Grade 4—85 pct-90 pct	11.75

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	36%
Electrodeposited	31%
Rolled, oval, straight, delivered ..	32%
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33
Zinc, Cast, 99.99	18%
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver, 999 fine	
Rolled, 1000 oz lots, per oz.	88¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	40.50
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz 70%	
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 52S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16: 2S, 3S, 32.5¢; 56S, 33¢; base, 30,000 lb.

Magnesium

(Cents per lb, f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSA. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, \$1.25-\$1.31; 24, \$1.71-\$1.75.

Round Rod: M, diam, in., ¼ to ¾, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3¼ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ¾, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3¼ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢ 33 to 40, 75.5¢ 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.21; 5/16 to ¾, \$1.12; ¾ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ¾, 89¢; ½ to ¾, 81¢; 0.065 to 0.082, ¾ to 1, 76¢; ¾ to 1, 72¢ 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, L.C.I.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per lb)

	Extruded Shapes	Rods	Sheets
Copper	32.78		32.93
Copper, hot rolled.	29.25		
Copper, drawn	30.25		
Low brass	39.13	30.32	30.63
High brass	32.30	29.58	29.89
Red brass	39.74	30.93	31.24
Naval brass	28.73	27.48	33.42
Brass, free cutting	27.23	23.64	
Commercial bronze	40.86	32.05	32.36
Manganese bronze	32.28	30.78	36.92
Phosphor bronze,			
5 pct.		50.98	50.75
Muntz metal	28.42	27.17	31.61
Everdur, Herculey			
Olympic, etc.	36.30	34.80	37.71
Nickel silver, 5 pct. 40.54		39.53	37.92
Architectural bronze 27.23			

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

Copper and Brass

No. 1 heavy copper and wire ..	14½—15
No. 2 heavy copper and wire ..	13½—14
Light copper	12½—13
Auto radiators (unsweated) ..	9½—10
No. 1 composition	11½—12
No. 1 composition turnings ..	11—11½
Clean red car boxes	10—10½
Cocks and faucets	9¾—10
Mixed heavy yellow brass	7½—8
Old rolled brass	7½—8
Brass pipe	9—9½
New soft brass clippings	11½—12
Brass rod ends	10½—11
No. 1 brass rod turnings	10—10½

Aluminum

Alum. pistons free of struts ..	5½—6
Aluminum crankcases	5½—6
2S aluminum clippings	7—7½
Old sheet & utensils	6—6½
Mixed borings and turnings ..	2—2½
Misc. cast aluminum	5½—6
Dural clips (24S)	5½—6

Zinc

New zinc clippings	6½—7
Old zinc	4½—5
Zinc routings	1½—2
Old die cast scrap	2½—3

Nickel and Monel

Pure nickel clippings	17½—18½
Clean nickel turnings	15—16
Nickel anodes	17½—18½
Nickel rod ends	18—19
New Monel clippings	12—12½
Clean Monel turnings	7—7½
Old sheet Monel	10—10½
Old Monel castings	8—8½
Inconel clippings	8—8½
German silver clippings, mixed	8—8½
German silver turnings, mixed	6—6½

Lead

Soft scrap lead	12½—13
Battery plates (dry)	7½—7¾

Miscellaneous

Block tin	67—68
No. 1 pewter	50—52
No. 1 auto babbitt	38—40
Mixed common babbitt	11½—12
Solder joints	13½—14
Siphon tops	38—39
Small foundry type	14—14½
Monotype	12—12½
Lino and stereotype	11½—12
Electrotype	10—10½
New type shell cuttings	10½—11
Clean hand picked type shells	4½—5
Lino and stereo dross	5—5½
Electro dross	3—3½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.	
Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point ..	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

Prices Rise for First Time in 2 Months

New York

... For the first time since it began late in March to recede from its postwar peak, the scrap market is showing signs of strength. The signs are not all positive nor can they be backed up by price increases in all major markets. But No. 1 heavy melting steel was \$2.50 a ton higher in Pittsburgh this week and gains were posted in Boston, Philadelphia, Detroit and New York. Elsewhere there were reports of strength but no sales at higher prices.

Scrap sources gave as reason for the stronger price undertone the fact that more consumers are coming into the market. At the same time dealers' stocks are not particularly good and brokers and dealers are not able to buy and ship as much material as consumers would like.

PITTSBURGH—Prices took a turn upward this week when at least three mills purchased in the district at prices better than the \$29.50 to \$30 a ton range quoted during recent weeks. The prices paid ranged from \$31 to \$32.50 a ton delivered. With this indication of market strength, there was a counter indication of weakness. One very large consumer stopped all shipments of scrap because of heavy inventories and the inability to handle incoming cars. It is believed that if this action had been known by other consumers at the time it would have tempered the higher bidding. Mills appear to have lost some of their enthusiasm for driving down scrap prices. Some buyers who a month ago were talking about \$25 to \$26 scrap are now saying they can't see the price dropping much below \$30 a ton. Cast grades continue weak with No. 1 cupola cast moving at \$37 to \$38, down \$1 from last week. Foundries have been laying back contributing to what weakness the market has shown, but observers feel they will soon be buying.

CHICAGO—The market is quiet but firmer with most tonnage moving against old orders. Mills continue to remain out of the market while dealers appear to be content to keep their present holdings of most grades or are attempting to build up inventories that were badly depleted during the past several months. Demand for malleable and No. 1 machinery cast is apparently considerably in excess of the amount of scrap being supplied at existing prices.

PHILADELPHIA—The market had a firm undertone during the week and brok-

ers were required to pay higher prices for heavy melting grades, narrowing the spread to 50¢ a ton. The cast market is stronger with heavy breakable selling at \$39. Turnings are stronger but this has not yet been reflected in increased prices. Dealers' inventories are small. Mills continue buying on a small order basis.

NEW YORK—Prices were higher this week. A lot more mills have come into the market but brokers are having trouble picking up fair tonnages because most sources seem to have been fairly well cleaned out. More melting steel is going West than in the past few weeks. Cast was stronger; some brokers were paying up to \$38 for occasional lots of good machinery cast though the major foundries were not willing to move up much on No. 1 cupola.

DETROIT—The Detroit scrap market is stronger again this week with openhearth prices advancing approximately \$1 as competition between brokers and dealers for available scrap continues. Prices as high as \$30 per ton delivered have been reported. Turnings and borings are also stronger although no open market sales have been reported to justify an advance in the prices previously quoted. Cast grades are firmer with sales at prices as high as \$40 for No. 1 cupola cast indicated.

CLEVELAND—Pressure for higher prices is getting at least lip service from some brokers and dealers, while major consumers continue to take a firm stand against any increases. In the absence of any heavy buying, prices remained firm here and in the Valley and increases in other districts have had no local effect thus far. Flurries of higher prices are being rumored, and releases on some of the old high priced orders are a contributing factor in the market.

BOSTON—Sentimentally, market is stronger; physically quiet. For strictly No. 1 heavy \$25 a ton f.o.b. is being done, but for less desirable \$23 to \$23.25, mostly \$23.25. Pittsburgh is paying \$18.50 for machine shop turnings; other consumers \$17.75. Hardly enough other stuff is moving to establish prices. Yards report receipts of scrap light. Big buyers remain out of the cast market.

BUFFALO—The scrap market was quiet at the start of the week but with a healthier tone all around in expectation of new buying soon. The month old move to establish No. 1 heavy melting at a premium over No. 2 has fizzled and old orders at \$31 to \$33 have been cleaned up. Dealers reported a top price of \$30 for openhearth material. Shipments have fallen off to a point where they approximate consumption. Cast scrap was moving in fair volume at unchanged prices

but foundries were demanding closer grading of offerings.

CINCINNATI—Quietness reigns in the district iron and steel scrap market. The larger interests are virtually out of the market with reasonably substantial inventories. Heavy steel grades showed a little strength but most dealers and brokers are sitting back awaiting activity which may bring out the present underlying strength in the market.

BIRMINGHAM—Scrap prices here are unchanged for another week. Receipts at dealers' yards remain far below the unprecedented volume received when prices were at their peak but mills are able to obtain sufficient material to meet requirements. Demand is particularly strong locally for cast grades. Comparatively little scrap of any type is moving to northern points.

ST. LOUIS—Shipments of scrap iron to the St. Louis industrial district are sharply off this month. Some estimates place it as much as 50 pct less than a month earlier. Heavy rains in the area are suggested as one reason for the decline in shipments, and lower prices is given as another. Some dealers are believed to be holding off shipments in the hope that prices may advance but they are unchanged this week.

TORONTO—With Canadian scrap supply becoming more serious, officials of Wartime Prices and Trade Board urge dealers to exert every effort to support the country's steel production by a steady flow of scrap metals to the mills. At the same time, WPTB announces that no revision will be made in scrap prices established by the Board in 1942. Despite price advances in practically all other fields, including nonferrous scrap, no action has been taken on iron and steel scrap. Under present prices dealers do not look for any heavy outpouring of scrap from domestic sources and little effort is being made toward collecting scrap in the rural districts. Big consumers are turning to Europe for scrap and it is learned from reliable sources that big tonnages have been contracted for there.

Plan Summer Convention

Washington

... The Institute of Scrap Iron & Steel, Inc. has revived the pre-war custom of holding a 2-day midyear convention by scheduling the 1947 convention at French Lick Springs Hotel, French Lick, Ind., Aug. 22-23. One day will be devoted to business sessions and a meeting of the board of directors, and one day to golf, concluding with a dinner.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$32.00 to \$32.50
RR. hvy. melting	33.75 to 34.25
No. 2 hvy. melting	32.00 to 32.50
RR. scrap rails	38.00 to 39.00
Rails 2 ft. and under	42.00 to 42.50
No. 1 comp'd bundles	32.00 to 32.50
Hand bld. new shts.	32.00 to 32.50
Hvy. axle turn.	31.00 to 31.50
Hvy. steel forge turn.	31.00 to 31.50
Mach. shop turn	26.00 to 27.00
Short shov. turn	28.50 to 29.00
Mixed bor. and turn.	26.00 to 27.00
Cast iron borings	28.00 to 28.50
No. 1 cupola cast	36.00 to 37.00
Heavy breakable cast	30.00 to 30.50
Malleable	44.00 to 45.00
RR. knuck and coup.	40.00 to 41.00
RR. coil springs	40.00 to 41.00
Rail leaf springs	40.00 to 41.00
Roller steel wheels	40.00 to 41.00
Low phos	37.50 to 38.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.00 to \$29.50
No. 2 hvy. melting	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 dealers' bundles	28.00 to 28.50
Bundled mach. shop turn.	28.00 to 28.50
Galv. bundles	26.00 to 26.50
Mach. shop turn.	23.00 to 23.50
Short shov. turn.	25.00 to 25.50
Cast iron borings	24.00 to 24.50
Mix. borings & turn.	23.00 to 23.50
Low phos. hvy. forge	34.50 to 35.50
Low phos. plates	32.00 to 34.00
No. 1 RR. hvy. melt.	29.50 to 30.00
Rerolling rails	34.50 to 35.00
Miscellaneous rails	32.00 to 33.00
Angles & splice bars	35.50 to 36.00
Locomotive tires, cut	38.00 to 38.50
Cut bolster & side frames	35.50 to 36.00
Standard stl. car axles	39.00 to 39.50
No. 3 steel wheels	35.00 to 35.50
Couplers & knuckles	36.00 to 36.50
Malleable	48.00 to 50.00
No. 1 mach. cast.	37.50 to 38.50
Rails 2 ft. and under	38.00 to 39.00
No. 1 agricul. cast	36.00 to 36.50
Hvy. breakable cast.	32.50 to 33.00
RR. grate bars	32.00 to 32.50
Cast iron brake shoes	36.00 to 36.50
Cast iron carwheels	35.50 to 36.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	27.00 to 28.00
No. 2 bundles	27.00 to 28.00
Mach. shop turn	19.00 to 20.00
Shoveling turn.	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Mixed bor. & turn.	19.00 to 20.00
Low phos. plate	36.00 to 37.00
No. 1 cupola cast	42.00 to 44.00
Hvy. breakable cast.	33.00 to 34.00
Scrap rails	38.00 to 39.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	\$23.25 to \$25.00
No. 2 hvy. melting	23.25 to 25.00
Nos. 1 and 2 bundles	23.25 to 25.00
Busheling	21.00 to 23.00
Turnings, shoveling	19.50 to 19.75
Machine shop turn.	17.75 to 18.50
Mixed bor. & turn.	17.75
C'n cast. chem. bor.	21.00 to 22.00
No. 1 machinery cast.	45.00
No. 2 machinery cast.	45.00
Heavy breakable cast.	45.00
Stove plate	45.00

DETROIT

Per gross, ton. brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	\$26.75 to \$27.25
No. 2 hvy. melting	26.75 to 27.25
No. 1 bundles	26.75 to 27.25
New busheling	26.75 to 27.25
Flashings	26.75 to 27.25
Mach. shop turn.	21.50 to 22.00
Short shov. turn.	22.50 to 23.00
Cast iron borings	22.50 to 23.00
Mixed bor. & turn.	22.50 to 23.00
Low phos. plate	30.25 to 31.25
No. 1 Cupola cast	35.00 to 37.00
Hvy. breakable cast.	26.00 to 28.00
Stove plate	30.00 to 32.00
Automotive cast	33.00 to 35.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.50 to \$30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	29.50 to 30.00
No. 2 bundles	25.50 to 26.00
Mach. shop turn.	22.00 to 23.00
Shoveling turn.	22.50 to 23.00
Mixed bor. & turn.	20.00 to 21.00
Clean cast chemical bor.	29.00 to 30.00
No. 1 cupola cast	40.00 to 42.00
Hvy. breakable cast	38.00 to 39.00
Cast. charging box	38.00 to 39.00
Clean auto cast	40.00 to 42.00
Hvy. axle forge turn.	29.50 to 30.00
Low phos. plate	32.00 to 33.00
Low phos. punchings	32.00 to 33.00
Low phos. bundles	30.00 to 31.00
RR. steel wheels	37.00 to 37.50
RR. coil springs	37.00 to 37.50
RR. malleable	50.00 to 52.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	26.50 to 27.50
Bundled sheets	26.50 to 27.00
Mach. shop turn.	20.00 to 21.00
Locomotive tires, uncut.	33.00 to 34.00
Mis. std. sec. rails	30.00 to 32.00
Rerolling rails	32.00 to 33.00
Steel angle bars	35.00 to 36.00
Rails 3 ft. and under	37.00 to 38.00
RR. steel springs	34.00 to 36.00
Steel car axles	36.00 to 37.00
Stove plate	31.00 to 32.00
Grate bars	31.00 to 32.00
Brake shoes	32.00 to 33.00
Malleable	47.00 to 49.00
Cast iron car wheels	41.00 to 42.00
No. 1 machinery cast.	36.00 to 37.00
Breakable cast	29.00 to 30.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$27.00
No. 2 hvy. melting	27.00
No. 2 bundles	27.00
No. 1 busheling	27.00
Long turnings	22.00
Shoveling turnings	24.00
Cast iron borings	23.00
Bar crops and plate	\$29.00 to 30.00
Structural and plate	29.00 to 30.00
No. 1 cast	36.00 to 37.00
Stove plate	34.00 to 35.00
No. 1 RR hvy. melt.	28.00
Steel axles	30.00 to 31.00
Scrap rails	30.00 to 31.00
Rerolling rails	32.00 to 33.00
Angles & splice bars	29.00 to 30.00
Rails 3 ft. & under	29.00 to 30.00
Cast iron carwheels	30.00 to 31.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$30.50 to \$31.50
No. 2 hvy. melting	30.50 to 31.50
Low phos. plate	35.50 to 36.00
Mach. shop turn.	26.50 to 27.00
Short shov. turn.	27.50 to 28.00
Cast iron borings	27.50 to 28.00
Elec. furnace punch	35.50 to 36.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$25.00 to \$25.50
No. 2 hvy. melting	24.00 to 25.50
No. 2 bundles	24.00 to 25.50
Comp. galv. bundles	22.00 to 23.50
Mach. shop turn.	19.00 to 20.00
Mixed bor. & turn.	19.00 to 20.00
Shoveling turn.	20.75 to 21.75
No. 1 cupola cast	34.00 to 35.00
Hvy. breakable cast.	32.00 to 33.00
Charging box cast.	33.00 to 34.00
Stove plate	33.00 to 34.00
Clean auto cast.	34.00 to 35.00
Unstrip. motor blks.	30.00 to 31.00
C'n chem. cast bor.	22.00 to 22.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.00 to 30.00
Mach. shop turn	21.00 to 22.00
Shoveling turn.	23.00 to 24.00
Cast iron borings	21.00 to 22.00
Mixed bor. & turn.	21.00 to 22.00
No. 1 cupola cast	35.00 to 38.00
Charging box cast	29.00 to 30.00
Stove plate	30.00 to 35.00
Clean auto cast.	35.00 to 38.00
Malleable	39.00 to 41.00
Low phos. plate	32.00 to 34.00
Scrap rails	32.00 to 35.00
Rails 3 ft. & under	37.00 to 38.00
RR. steel wheels	37.00 to 38.00
Cast iron carwheels	37.00 to 38.00
RR. coil & leaf spgs.	37.00 to 38.00
RR. knuckles & coup.	37.00 to 38.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.50 to \$31.00
No. 2 hvy. melting	29.50 to 31.00
Compressed sheet stl.	29.50 to 31.00
Drop forge flashings	29.50 to 31.00
No. 2 bundles	29.50 to 31.00
Mach. shop turn.	26.00 to 26.50
Short shovel.	27.00 to 27.50
No. 1 busheling	29.50 to 31.00
Steel axle turn.	29.50 to 31.00
Cast iron borings	27.00 to 27.50
Mixed bor. & turn.	27.00 to 27.50
No. 1 machinery cast.	40.00 to 42.00
Malleable	50.00 to 55.00
RR. cast	40.00 to 41.00
Railroad grate bars	37.00 to 38.00
Stove plate	37.00 to 38.00
RR. hvy. melting	32.00 to 32.50
Rails 3 ft. & under	41.50 to 42.00
Rails 18 in. & under	42.50 to 43.00
Elec. furnace punch.	33.00 to 33.50

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	13.00
Elec. furn. 1 ft. und.	25.00
No. 1 cupola cast.	\$32.00 to 33.00
RR. hvy. melting	20.50

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50
No. 2 hvy. melting	19.50
No. 1 bales	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	14.50
No. 1 cupola cast	\$35.00 to 36.00
RR. hvy. melting	20.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$20.00 to \$21.00
Elec. furn. 1 ft. und.	23.00 to 25.00
No. 1 cupola cast	26.00 to 27.00
RR. hvy. melting	21.00 to 22.00

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point	
Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	31.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*
* Ceiling price	

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) This base price for annealed, bright finish wire, commercial spring wire. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6 (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) 0.035 to 0.075 in. thick by $\frac{3}{4}$ to $3\frac{1}{2}$ in. wide. (16) Some sales are at higher prices. (17) Delivered Los Angeles; add $\frac{1}{4}$ c per 100 lb for San Francisco. (18) Delivered Los Angeles only.

Basing Points	Pitts- burgh	Chica- go	Gary	Cleve- land	Bir- mingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	San Francisco, Los Angeles, Seattle	DELIVERED TO		
												Detroit	New York	Phila- delphia
INGOTS														
Carbon, re-rolling														
Carbon, forging	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00							
Alloy	\$52.00													
BILLETS, BLOOMS, SLABS														
Carbon, re-rolling	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00	\$42.00					\$45.00	
Carbon, forging billets	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00					\$53.00	
Alloy	\$61.00	\$61.00				\$61.00							\$64.00	
SHEET BARS							\$53.00			Portsmouth, Ohio = \$67.20				
PIPE SKELP	2.35¢	2.35¢					2.35¢	2.35¢		(Coatesville = 2.35¢)				
WIRE RODS	2.55¢	2.55¢		2.55¢	2.55¢							3.27¢ ¹³		
SHEETS														
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.875¢	2.50¢		3.24¢ ¹⁷	2.65¢	2.79¢
Cold-rolled ¹	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢				3.35¢	3.61¢
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢			4.32¢ ¹⁷		3.84¢
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢				3.70¢	3.95¢
Long ternes ² (10 gage)	3.55¢	3.65¢	3.55¢										3.95¢	3.91¢
STRIP														
Hot-rolled ³	2.50¢	2.50¢	2.50¢	2.50¢ ¹⁸	2.50¢		2.50¢						2.65¢	2.93¢
Cold-rolled ⁴	3.20¢	3.30¢		3.20¢			3.20¢			(Worcester = 3.40¢)			3.35¢	3.61¢
Cooperage stock	2.80¢	2.80¢			2.80¢		2.80¢							3.09¢
TINPLATE														
Standard coles, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85			(Warren, Ohio = \$5.75)	\$6.157	\$6.062 ¹¹
Electro, box														
BLACKPLATE, 29 gage ⁵	3.60¢	3.60¢	3.60¢		3.70¢			3.70¢	3.70¢			(Warren, Ohio = \$5.75)	3.99¢	3.90¢
BLACKPLATE, CANMAKING														
55 lb. to 70 lb.														
75 lb. to 95 lb.														
100 lb. to 118 lb.														
TERNES, MFG., Special coated														
BARS														
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢					3.285¢	2.75¢	3.01¢
Rail steel ⁶ , ¹⁰	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢							2.85¢
Reinforcing (billet) ⁷	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢				2.985¢		2.74¢
Reinforcing (rail) ⁷ , ¹⁶	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢						
Cold-finished ⁸	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢						3.35¢	3.61¢
Alloy, hot-rolled	3.05¢	3.05¢					3.05¢	3.05¢		(Bethlehem, Massillon, Canton = 3.05¢)			3.20¢	3.19¢
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢						3.95¢	
PLATE														
Carbon steel ¹²	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢	2.65¢		(Coatesville, Claymont = 2.80¢, Geneva, Utah = 2.80¢)			2.87¢	2.85¢
Floor plates	3.90¢	3.90¢												4.30¢
Alloy	3.79¢	3.79¢												4.01¢
SHAPES, Structural	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢				(Geneva, Utah = 2.65¢) (Bethlehem = 2.50¢)		3.17¢ ¹⁸	2.70¢	2.84¢
SPRING STEEL, C-R														
0.26 to 0.40 carbon	3.20¢			3.20¢						(Worcester = 3.40¢)				
0.41 to 0.60 carbon	4.70¢			4.70¢						(Worcester = 4.90¢)				
0.61 to 0.80 carbon	5.30¢			5.30¢						(Worcester = 5.50¢)				
0.81 to 1.00 carbon	6.80¢			6.80¢						(Worcester = 7.00¢)				
Over 1.00 carbon	9.10¢			9.10¢						(Worcester = 9.30¢)				
MANUFACTURERS' WIRE ⁹														
Bright ¹⁰	3.30¢	3.30¢		3.30¢	3.30¢					(Worcester = 3.40¢, Duluth = 3.35¢)		5.63¢ ¹³	3.71¢	3.68¢
Galvanized										Add proper size extra and galvanizing extra to Bright Wire Base				
Spring (high carbon)	4.25¢	4.25¢		4.25¢						(Worcester = 4.35¢, Duluth = 4.50¢) (Trenton = 4.50¢)		5.24¢ ¹³	4.66¢	4.59¢
PILING, Steel sheet	3.00¢	3.00¢					3.00¢							3.41¢

PRICES

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.....	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.....	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading.....	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt.....	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville.....	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.....	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-r, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.....	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton.....	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi.....	27.50	26.00	20.50	21.00	24.50	30.00
Sh-ets, P'gh, Chi, Middletown, Canton, Balt.....	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.....	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown.....	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila., Ft. Wayne.....	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.....	32.48	30.30	23.80	24.34	34.62	56.28
Rod, h-r, Syracuse.....	27.03	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 to 6 in.).....	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)

W	Cr	V	Mo	Base per lb
18	4	1	—	74¢
1.5	4	1.5	8	59¢
6	4	2	6	63¢
High-carbon-chromium*				47¢
Oil hardening manganese*				26¢
Special carbon*				24¢
Extra carbon*				20¢
Regular carbon*				16¢
Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.				

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade.....	4.20¢
Armature.....	4.50¢
Electrical.....	5.00¢
Motor.....	5.75¢
Dynamo.....	6.45¢
Transformer 72.....	6.95¢
Transformer 65.....	7.65¢
Transformer 58.....	8.35¢
Transformer 52.....	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb.....	\$2.50
Angle splice bars, 100 lb.....	3.00
(F.o.b. basing points) per 100 lb	
Light rails (from billets).....	\$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa.	2.95

Base per lb

Cut spikes.....	4.50¢
Screw spikes.....	6.10¢
Tie plate, steel.....	2.80¢
Tie plates, Pacific Coast.....	2.95¢
Track bolts.....	6.50¢
Track bolts, heat treated, to rail roads.....	6.75¢
Track bolts, jobbers discount.....	63-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

20x14 in. 20x28 in.	
3-lb coating I.C.....	\$6.75 \$13.50

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00 *22.00
Nickel-clad	
10 pct, f.o.b. Coatesville, Pa.	21.50
Inconel-clad	
10 pct, f.o.b. Coatesville..	30.00
Monel-clad	
10 pct, f.o.b. Coatesville..	29.00
Aluminized steel	
Hot dip, 20 gage, f.o.b. Pittsburgh	9.00

*Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per San	keg Francisco
Standard, galvanized and coated nails.....	\$3.75†	\$4.83
Cut nails, carloads, Pittsburgh base.....	5.30	.....

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb	
Annealed fence wire....	\$3.95‡	\$4.96
Annealed galv. fence wire.....	4.40‡	5.41

†10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column 84	107
Woven wire fence*.....	90††	...
Fence posts, carloads.....	86	110
Single loop bale ties..	94	114
Galvanized barbed wire**	94	...
Twisted barbless wire..	94	...

*15½ gage and heavier. **On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Ald-cor	Corten	Double Strength No. 1	Dyn-alloy	Hi Steel	Mayari R	Ota-cloy	Yoloy	Y-50	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois Republic	Repub-lic	Alan Wood	Inland	Bethle-hem	Jones & Laughlin	Young-town Sheet & Tube	Amer-ican Rolling Mill	Great Lakes Steel
Plates.....	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	....	4.10
Sheets										
Hot-rolled...	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled...	4.75	4.75	4.75	....	4.75	4.75	4.75	4.75	5.225*	4.65
Galvanized...	....	5.40	....	....	....	5.40	....	....	....	....
Strip										
Hot-rolled...	3.85	3.85	3.85	....	3.85	3.85	3.85	3.85	....	3.75
Cold-rolled...	....	....	4.75	....	....	4.75	4.75	4.75	5.00*	4.55†
Shapes.....	....	3.85	....	....	3.85	3.85	3.85	3.85	....	....
Beams.....	....	3.85	....	....	....	3.85	....	....	....	....
Bars										
Hot-rolled...	4.00	4.00	4.00	....	....	4.00	4.00	4.00	....	4.00
Cold-rolled...	....	....	....	....	....	....	....	4.60	....	....
Bar shapes.....	....	4.00	....	....	4.00	4.00	4.00	4.00	....	....

* 21 gage and lighter. † Pittsburgh, add 0.10¢ at Chicago and Gary.

PRICES

PIPE AND TUBING

Base discounts. F.o.b. Pittsburgh and Lorain, steel butt weld and seamless. Others f.o.b. Pittsburgh only

Base price, \$200.00 per net ton

Standard, threaded & coupled

Steel, butt weld	Black	Galv.
1/2 in.	55 1/2	41
3/4 in.	58 1/2	46
1 to 3-in.	60 1/2	47 1/2
Wrought Iron, butt weld		
1/2 in.	2	+20
3/4 in.	11 1/2	+10
1 and 1 1/2 in.	17	+2
1 1/2 in.	22 1/2	1 1/2
2 in.	23	2
Steel, lap weld		
2 in.	53	39 1/2
2 1/2 and 3 in.	56	42 1/2
3 1/2 to 6 in.	58	44 1/2
Steel, seamless		
2 in.	52	38 1/2
2 1/2 and 3 in.	55	41 1/2
3 1/2 to 6 in.	57	43 1/2
Wrought Iron, lap weld		
2 in.	14 1/2	+5 1/2
2 1/2 to 3 1/2 in.	17	+1 1/2
4 in.	21	4
4 1/2 to 8 in.	19	2 1/2

Extra Strong, plain ends

Steel, butt weld		
1/2 in.	54 1/2	41 1/2
3/4 in.	58 1/2	45 1/2
1 to 3-in.	60	48
Wrought Iron, butt weld		
1/2 in.	6 1/2	+14
3/4 in.	12 1/2	+8
1 to 2 in.	22	2
Steel, lap weld		
2 in.	52	39 1/2
2 1/2 and 3 in.	56	43 1/2
3 1/2 to 6 in.	59 1/2	47
Steel, seamless		
2 in.	51	38 1/2
2 1/2 and 3 in.	55	42 1/2
3 1/2 to 6 in.	58 1/2	46
Wrought Iron, lap weld		
2 in.	17 1/2	+2
2 1/2 to 4 in.	26	8 1/2
4 1/2 to 6 in.	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft. inclusive.

O.D. Gage	Seamless	Electric Weld
in in. BWG	Hot-Rolled	Cold-Drawn
2	15.29	18.17
2 1/2	20.57	24.43
3	22.87	27.18
3 1/2	28.86	34.30
4	35.82	42.55

CAST IRON WATER PIPE

6-in. to 24-in. del'd Chicago	Per net ton
6-in. to 24-in. del'd New York	\$81.56
6-in. to 24-in. Birmingham	79.80
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	95.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots	Percent Off List
1/2 in. & smaller x 6 in. & shorter	55
Over 6 in.	45
9/16 & 1 in. x 6 in. & shorter	52
9/16 through 1 in. x over 6 in.	48
1 in. x 6 in. & shorter	51
1 1/2 in. & larger, all lengths	48
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Flow bolts	57

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/2 to 1 1/2 in. inclusive	45
1 1/2 in. and larger	44

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts U.S.S. S.A.E.

Base discount less case lots	
7/16 in. and smaller	51
1/2 in. and smaller	48
1/2 in. through 1 in.	48
9/16 in. through 1 in.	47
1 1/2 in. through 1 1/2 in.	45
1 1/2 in. and larger	44

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts Consumer

Packages, nuts separate 60 and 10
In bulk 74

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets (1/2 in. and larger) Base per 100 Lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$5.25
F.o.b. Lebanon, Pa.	5.40

Small Rivets (7/16 in. and smaller) Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5
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Cap and Set Screws Percent Off List (In packages) Consumer

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56
1/2 to 1 in. x 6 in., SAE 1035, heat treated	47
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Phillister head cap, listed sizes	40

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF ₂ Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, non-bessemer	5.80
Mesabi, bessemer	5.70
Mesabi, non-bessemer	5.55
High phosphorus	5.55
Prices quoted retroactive to Jan. 1, 1947.	

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	23¢ to 27¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Swedish sponge iron, 100 mesh, c.l.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	66¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	25¢ to 31¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	17¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to \$1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.02¢
Lead, 100, 200 & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	33¢
Nickel, 150 mesh	51 1/2¢
Silicon, 100 mesh	18.15¢
Solder powder, 100 mesh	3 1/2¢ plus metal
Tin, 100 mesh	90¢
Tungsten metal powder, 98% 99%, any quantity, per lb.	\$2.90
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$10.00 to \$11.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	11.00 to 12.00
Foundry, Byproduct	
Chicago, del'd	\$16.10
Chicago, f.o.b.	15.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, del'd	15.46
Buffalo, del'd	16.14
Ashland, Ohio, f.o.b.	13.35
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	15.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	13.25

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Ohio	\$64.00
First quality, Pa., Md., Ky., Mo.	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo.	64.00
Sec. quality, New Jersey	59.00
Sec. quality, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

Silica Brick	
Pennsylvania and Birmingham	\$70.00
Chicago District	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	\$59.00

Magnesite Brick	
Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in bulk	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, O.	10.55
Midwest, add 10¢; Mo. Valley, add 20¢	

PRICES

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		Plates	Standard Structural Shapes	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia.....	\$4.14	\$5.18	\$5.29	\$4.43	\$5.28	\$4.44	\$4.22	\$4.48	\$5.13	\$8.37	\$8.37	\$9.88	\$9.88
New York.....	4.22	5.17 ¹	5.47	4.62	5.40	4.62	4.37	4.62	5.17	8.42	8.42	9.92	9.92
Boston.....	4.30	5.12 ¹²	5.55 ¹²	4.65	6.36	4.70	4.47	4.62	5.22	8.62	8.62	9.97	9.97
Baltimore.....	3.89	.....	5.14	4.40	.....	4.39	4.34	4.45	5.10	.....	.....	.....	.....
Norfolk.....	4.15	.....	.....	.....	.....	4.50	4.50	4.75	5.50	.....	.....	.....	.....
Chicago.....	3.65	.....	.....	4.05	5.05	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee.....	4.099	4.899 ¹	5.249	4.199	.....	4.399	4.249	4.899	8.399	8.399	8.399	9.649	9.649
Cleveland.....	3.95	4.55	5.238	4.188	5.00	4.25	4.311	4.10	4.75	8.358	8.358	9.35	9.35
Buffalo.....	3.95	4.65 ¹	5.35	4.30	5.25	4.55	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Detroit.....	3.95	4.75	5.42	4.34	5.24	4.59 ¹	4.42	4.20	4.87	8.51	8.51	9.74	9.74
Cincinnati.....	3.916	4.716	5.166	.....	.....	4.553	4.444	4.403	5.053 ¹	.....	.....	.....	.....
St. Louis.....	3.999	4.799 ¹	5.424	4.199	5.424	4.399	4.249	4.249	5.074	8.574	8.574	9.824	9.824
Pittsburgh.....	3.95	4.65 ¹	5.10	4.05	4.95	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
St. Paul.....	4.184 ⁷	4.984 ¹	5.434 ²	4.384 ⁷	.....	4.584 ⁷	4.434 ⁷	4.434 ⁷	5.476 ⁶	.....	.....	.....	.....
Omaha.....	4.668	6.118 ¹	5.918	4.868	.....	5.068	4.918	4.918	5.818	.....	.....	.....	.....
Indianapolis.....	3.84	4.84	5.29	4.24	5.01	4.51	4.36	4.56	5.01	.....	.....	.....	.....
Birmingham.....	3.65 ¹¹	.....	5.20	4.00 ¹¹	.....	4.30 ¹¹	4.05 ¹¹	4.05 ¹¹	5.58	.....	.....	.....	.....
Memphis.....	4.27	.....	5.97	4.72	.....	4.92	4.67	4.67	5.78	.....	.....	.....	.....
New Orleans.....	4.26 ¹¹	5.77 ¹	.....	.....	.....	4.83 ¹¹	4.68 ¹¹	4.78 ¹¹	6.14	.....	.....	.....	.....
Los Angeles.....	5.15	7.00 ¹	6.70	5.65	8.35 ⁵	5.20 ¹²	5.20 ¹²	5.10 ¹³	6.90 ¹⁴	9.65 ¹⁰	9.35	11.05	11.05
San Francisco.....	4.7C ⁸	6.3C ⁹	6.45	5.2C ⁸	.....	5.0C ⁸	4.9C ⁸	4.75 ⁸	7.00 ¹⁰	.....	.....	.....	.....
Seattle.....	4.80 ⁴	6.75 ²	6.30	5.3C ⁴	.....	5.15 ⁴	4.95 ⁴	5.00 ⁴	7.10 ¹⁴	.....	9.50 ⁶	.....	10.95 ⁶
Portland.....	4.80 ³	.....	6.25 ⁹	5.5C ³	.....	5.4C ³	5.1C ³	5.1C ³	7.20	.....	9.30	.....	.....
Salt Lake City.....	6.05	.....	7.71	6.50	.....	6.10	6.25	6.25	7.50 ¹⁰	.....	.....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb.

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 lb and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1899; (14) 1500 and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	34.00	34.50	35.00	35.50	.....	Boston	Everett	\$0.50 Arb.	29.50	30.00	30.50	31.00	.....
Birdsboro	34.00	34.50	35.00	35.50	39.00	Boston	Birdsboro-Steelton	4.82	.....	.....	.....	.....	43.82
Birmingham	29.48	29.68	.....	.....	.....	Brooklyn	Bethlehem	3.00	37.00	37.50	38.00	38.50	.....
Buffalo	32.50	33.00	33.50	.....	.....	Brooklyn	Birdsboro	3.50	.....	.....	.....	.....	42.50
Chicago	32.50	33.00	33.50	34.00	.....	Cincinnati	Birmingham	4.87	34.25	34.75	.....	.....	.....
Cleveland	32.50	33.00	33.50	.....	.....	Jersey City	Bethlehem	1.84	35.84	36.34	36.84	37.34	.....
Duluth	33.00	33.50	34.00	34.50	.....	Jersey City	Birdsboro	2.33	.....	.....	.....	.....	41.33
Erie	22.50	33.00	33.50	34.00	.....	Los Angeles	Provo	5.94	38.94	39.44	.....	.....	.....
Everett	23.00	29.50	30.00	30.50	.....	Mansfield	Cleveland-Toledo	2.33	34.63	35.13	35.63	36.13	.....
Granite City	32.50	33.50	33.50	.....	.....	Philadelphia	Swedeland	1.01	36.01	36.51	37.01	37.51	.....
Neville Island	33.00	33.50	33.50	34.00	.....	Philadelphia	Birdsboro	1.49	.....	.....	.....	.....	40.49
Provo	33.00	33.50	.....	.....	.....	San Francisco	Provo	5.94	38.94	39.44	.....	.....	.....
Sharpville	33.00	33.50	33.50	34.00	.....	Seattle	Provo	5.94	38.94	39.44	.....	.....	.....
Steelton	34.00	.....	.....	.....	39.00	St. Louis	Granite City	0.75 Arb.	33.25	34.25	34.25	.....	.....
Struthers, Ohio	33.50	.....	.....	.....	.....				
Swedeland	35.00	35.50	36.00	36.50	.....							
Toledo	32.50	33.00	33.50	34.00	.....							
Troy, N. Y.	34.00	34.50	35.00	35.50	39.00								
Youngstown	33.00	33.50	33.50	34.00	.....							

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$40.50; f.o.b. Buffalo—\$41.75. Add \$1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct.

Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$40.50 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$45.99. High phosphorous charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.
 Carload lots (bulk) \$135.00
 Less ton lots (packed) 157.00
 F.o.b. Pittsburgh 139.50
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.
 Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.
 Eastern Central Western
 Carload, bulk 7.00 7.25 7.30
 Ton lots 8.00 8.60 10.50
 Less ton lots 8.40 9.00 10.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.
 16-19% Mn 19-21% Mn
 3% max. Si 3% max. Si
 Carloads \$43.00 \$44.00
 F.o.b. Pittsburgh 47.00 48.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
 Carload, bulk 30
 L.c.l. lots 32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
 Carloads 32
 Ton lots 34
 Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.
 Carloads Ton Less
 0.06% max. C, 0.06% P, 90% Mn 21.00 22.10 22.70
 0.10% max. C 20.50 21.60 22.20
 0.15% max. C 20.00 21.10 21.70
 0.30% max. C 19.50 20.60 21.20
 0.50% max. C 19.00 20.10 20.70
 0.75% max. C 16.00 17.10 17.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.
 Carload, bulk 6.65
 Ton lots 7.70
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet 6.75
 Ton lots 7.75
 Less ton lots 8.15

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$68.00 f.o.b. Keokuk, Iowa; \$65.75 f.o.b. Jackson, Ohio; \$67.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.
 Eastern Central Western
 96% Si, 2% Fe.. 15.60 17.85 19.60
 97% Si, 1% Fe.. 16.00 18.25 20.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.
 Eastern Central Western
 Carload, bulk 4.25 4.50 4.70
 Ton lots 5.25 5.85 6.15
 Less ton lots 5.65 6.25 6.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 25% Si 11.65
 50% Si 7.80 8.30 8.50
 75% Si 10.00 10.30 11.05
 80-90% Si 11.30 11.60 12.35
 90-95% Si 12.80 13.10 13.80

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 0.06% C 23.00 23.40 24.00
 0.10% C 22.50 22.90 23.50
 0.15% C 22.00 22.40 23.00
 0.20% C 21.75 22.15 22.25
 0.50% C 21.50 21.90 22.00
 1.00% C 21.00 21.40 21.50
 2.00% C 20.50 20.90 21.00
 65-69% Cr, 4-9% C 15.60 16.00 16.15
 62-66% Cr, 4-6% C 16.60 17.00 17.15
 6-9% Si 16.60 17.00 17.15
 Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.
 Eastern Central Western
 Carload, bulk.. 9.85 10.10 10.20
 Ton lots 10.75 11.65 12.25
 Less ton lots .. 11.15 12.05 12.65

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Eastern Central Western
 Carload 16.70 17.10 17.25
 Ton lots 17.90 19.20 20.00
 Less ton lots .. 18.60 19.90 20.70
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
 Eastern Central Western
 Carload 21.00 21.40 21.50
 Ton lots 22.35 23.00 24.20
 Less ton lots.. 23.35 24.00 25.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.
 Eastern Central Western
 0.20% max. C.. 83.50 85.00 86.25
 0.50% max. C.. 79.50 81.00 82.25
 9.00% min. C.. 79.50 81.00 82.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.
 Eastern Central Western
 Carloads 14.00 14.50 16.55
 Ton lots 16.10 16.85 19.00
 Less ton lots.. 17.10 17.85 20.00

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 16-20% Ca, 14-18% Mn, 53-59% Si.
 Eastern Central Western
 Carloads 15.50 16.00 18.05
 Ton lots 17.60 18.45 20.20
 Less ton lots.. 18.60 19.45 21.20

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.
 Cast Turnings Distilled
 Ton lots \$1.60 \$2.35 \$2.95
 Less ton lots .. 1.95 2.70 3.75

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
 Eastern Central Western
 Ton lots 16.00 17.10 19.05
 Less ton lots.. 16.75 17.85 19.80

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.
 Eastern Central Western
 Ton lots 14.25 15.35 17.30
 Less ton lots.. 15.00 16.10 18.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... \$2.25
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.
 Openhearth \$2.70
 Crucible \$2.80
 High speed steel (Primos)... \$2.90
 Vanadium pentoxide, 88-92% V₂O₅ technical grade, contract basis, per pound contained V₂O₅ \$1.10
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb
 Ton lots \$2.50
 Less ton lots \$2.55
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 95¢
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 80¢
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo 80¢
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo 80¢
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti \$1.23
 Less ton lots \$1.25
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti \$1.35
 Less ton lots \$1.40
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton.. \$142.50
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload lots 17.00¢
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy
 Carload, bulk 5.50¢
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload 6.25¢
 Ton lots 6.75¢
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots 9.00¢
 Ton lots 9.75¢
Boron Agents
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
 Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.
 Eastern Central Western
 Less ton lots.. \$1.30 \$1.3075 \$1.329
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.
 Ton lots \$1.89 \$1.903 \$1.935
 Less ton lots 2.01 2.023 2.055
 Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.
 Less ton lots.. \$2.10 \$2.1125 \$2.1445
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
 Carload lots 35¢
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
 No. 1 87.5¢
 No. 6 60¢
 No. 79 45¢
 Bortram, f.o.b. Niagara Falls
 Ton lots, per pound 45¢
 Less ton lots, per pound..... 50¢
 Carbortam, f.o.b., Suspension Bridge, N.Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.
 Ton lots, per pound 8.0¢

British Coal Production So Far This Year Up 3 Million Tons

London

• • • The latest box score in the British coal battle has been posted, showing a loss of 895,000 long tons due to the winter weather and transport difficulties. Sir Stafford Cripps, President of the Board of Trade, estimates that the crisis also cost Britain \$800 million in exports—meaning that British imports must suffer to that extent.

Production results for the coal mines for the first 17 weeks of 1947 (see table I) indicate an overall improvement of about 3 million tons over the previous year, due primarily to the successful recruitment of miners. At the beginning of this year (week ended Dec. 28, 1946), the total number of wage earners on mine books amounted to 692,000. Since that date there has been a steady and continuous increase, the total amounting for the week ending Apr. 19 to 711,000, an increase of 19,000 in a period of 17 weeks. The average weekly increases since the beginning of the year are as follows:

1947	Average Weekly Increase
January	720
February	880
March	1640
April (first 3 weeks)	1330

The net improvement which has taken place is due almost entirely to improved recruitment.

The following table shows how the weekly increases were on the average distributed among the various categories in the first quarter of 1947. The corresponding figures for 1946, which are also given, show that the improvement this year is due mainly to an increase in the number of ex-miners from other industries, but also to a noticeable extent to an increase in the number of juveniles recruited. There has been a large drop in the number of ex-miners from the armed forces as this source is almost exhausted. Sir Stafford did not mention that the return of ex-miners from other industries is generally attributed by British

Reports Winter Coal Crisis Resulted in a Loss Of 895,000 Long Tons

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sources to a new faith in the industry due to nationalization.

Recruitment: Weekly Averages

	1947 (first quarter)	1946 (first quarter)
Juveniles under 18	390	230
Ex-miners from the armed forces	150	850
Ex-miners from other industries	830	370
Other adults from other industries	410	80
Trainees from government training centers	200	80
Unclassified	170	..
	<u>2150</u>	<u>1610</u>

Miners actually working at the coal face numbered 281,000 in Dec. 28, 1946, and have since risen to 286,000. Considering the difficulties in finding additional face room on so high a scale at short notice, the government considers this increase to be encouraging, even though it has not sufficed to maintain the normal ration of face workers to other workers.

In the first 17 weeks of 1947 total absenteeism amounted on the average to 16.32 pct as compared with an average of 17.69 pct in the cor-

responding period of 1946. This improvement is, however, more apparent than real, for it is entirely due to a reduction in long-term absenteeism caused by the discharge of unwilling workers after the lifting of the wartime compulsory labor order last autumn. There has actually been a slight increase in short-term absenteeism this year as compared with 1946.

One of the problems in which the British Government is most interested is the miner's output per manshift. The figures released by Sir Stafford at the most recent of his press conferences show the changes in output per manshift in the first 4 months of this year as compared with 1946. Owing to the bad weather in February and March last, the figures for those months are not comparable with those for 1946.

In the two comparable months (January and April) there has been a significant improvement this year over 1946. January output this year totaled 1.06 long tons per manshift, compared with 1.00 tons last year, and April this year 1.03 tons as against 1.01 tons last year. The fact that the figures for April are lower than those for January is due to Easter falling in the former month in both years.

About half the improvement this year is due to an increase of output per manshift, at the face, the other half being due to an in-

TABLE 1
Thousands of Long Tons

	Jan.-Apr. 1947 (17 weeks)	Jan.-Apr. 1946 (17 weeks)	Increase in 1947 over 1946
Total output:			
Deep mined	61,337	58,225	3,112
Opencast	2,509	2,461	48
Total	<u>63,846</u>	<u>60,686</u>	<u>3,160</u>
Average weekly output:			
Deep mined	3,608	3,425	183
Opencast	148	145	3
Total	<u>3,756</u>	<u>3,570</u>	<u>186</u>

"The Arthur Morgan Company

OF ST. LOUIS, MISSOURI

• Won a New Contract! "



TECHNICAL SALES SERVICE REPORT



Problem: To move and to re-erect seven surplus storage tanks from a closed U.S. Arsenal to a new location. These 21 foot high, 24 foot diameter tanks had to be moved with a minimum of dismantling and without distortion.

Solution: We advised machine gas cutting the $\frac{1}{2}$ " thick tank plates into six sections with an Airco #10 Radiograph. A "track" to guide the Radiograph was cut, tack welded into position around the tank and the tank cut into three horizontal sections. These three sections were then cut in half, loaded on a truck, and moved to the new location where they were reassembled by arc welding. These "new" tanks, welded and leak-proof, proved entirely satisfactory and as a result the Arthur Morgan Company won a new contract to move an additional 35 tanks.

W. Ruffley

Airco Technical Representative

Airco's Technical Sales Division is at the call of all industry in applying Airco processes and products in the solution of their problems. If you have a metal working problem, ask to have a Technical Sales Division man call. Address: Dept. I.A.-5962, Air Reduction, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.



AIR REDUCTION

Offices in All Principal Cities

TECHNICAL SALES SERVICE—ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

crease in the percentage of face shifts worked to total shifts worked.

Recognizing the dangers of advance guessing, Sir Stafford made the following statement on the future outlook: "In view of the uncertainties caused by the introduction of the 5-day week, it is exceptionally difficult this year to forecast the level of output during the summer. We know that we shall start the summer with a rather larger labor force than we originally expected.

"We know also, however, that we cannot avoid losing the output hitherto obtained on Saturday by those face workers whose Saturday shift was their sixth shift; we cannot yet judge the extent to which this loss will be made good by improvements in attendance on other days of the week or by improvements in output per manshift. It is not possible to make any firm forecast of output this summer until we have at least a few weeks' experience of actual 5-day week conditions."

Normally the summer coal allocations program for industry in Britain are introduced at the beginning of May. In view of the uncertainties and the serious dislocation in coal supplies caused by the emergency conditions of February-March, it was decided this year that it was best to continue with the existing arrangements until the end of May, introducing the summer program one month later. The government took advantage, however, of the improvement in the supply situation to make available additional quantities of coal to industry in April when the basic allowance for industry in general was raised to 50 pct of its winter requirements.

Meanwhile the Cabinet has been considering what arrangements should be made for the allocation of coal to industry as from June 1 onwards for the five remaining months of the so-called summer period.

Impressed by the fact that supplies of coal to industry on the level indicated in the coal budget would cause not only great industrial dislocation during the summer but also involve shortages of materials and components which would seriously prejudice the operation of industry throughout the winter, the government is altering

an earlier estimate which would have given industry 65 pct of its requirements.

This would have called for a very selective system of distribution; and there would be a grave danger of disrupting the relation between one industry and another. It would, therefore, be clearly undesirable to plan allocations on an unduly cautious basis with all the paraphernalia of priorities that this would involve. Equally it would be useless to plan allocations at a higher level, if there were no hope of actual deliveries coming forward at that level.

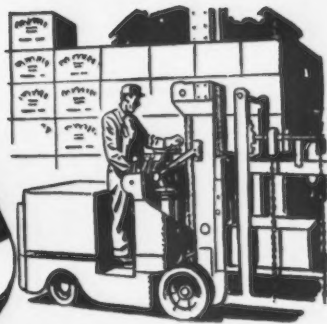
The Cabinet Raw Materials Committee has accordingly re-examined the earlier budget figures and is basing its plans for industry during the summer on a more favorable assumption, namely that total output will reach 93 million long tons during the summer months as compared with the earlier estimate of 89 million tons.

If Britain is to achieve a production of 93 million tons in all, output needs to be 3.8 million tons per full working week. Average weekly output for the first 17 weeks of this year has been 3.76 million tons. The latest available figures relate to the weeks ending Apr. 19 when it was 3.97 million tons and Apr. 26 when it was 4.01 million tons.

In addition to the extra 4 million tons put into the budget from increased supply, it is now clear that Britain will finish the 1946-47 coal year ending May 31 with rather higher stocks than were originally anticipated. It shall, therefore, need a million tons less for stockbuilding during the summer.

Allowing for these factors, therefore, Sir Stafford feels justified in basing allocations to industry during the summer — for both consumption and stockbuilding—on a total availability of about 25 million tons (for 6 months). This compares with total requirements including stockbuilding estimated at about 28 million tons. In view of the uncertainty which must remain concerning coal output during the summer, there is a considerable risk in planning allocations to industry on this higher level. If the present rate of output continues, coal deliveries to industry should meet what is required to cover the proposed new allocations to industry.

Under the new plan supplies of



**HEAVY
POWERED**

HANDLING EQUIPMENT

Tractors, Shop Mules, Cranes, Truck Lifts...

Here's the type of equipment which helped operate our huge Army and Navy warehouses so efficiently during the war ... 48 tractors (some have never been used), 39 shop mules, 8 cranes, 6 truck lifts—an air compressor, too. Much of this equipment has been used and will require repairs. Some of it can be put right to work without repairs.

Your bids are to be sent to the Accounting Division, Hawaii Regional Office, War Assets Administration, Kewalo Storage Yard, 1184 Ala Moana, Honolulu, T. H., and will be accepted up to the time of opening at:

9:30 a.m., Honolulu Time, Wednesday, June 4, 1947

FOR FURTHER DETAILS...

write, telephone or wire for Sealed Bid Circular No. 269, Descriptive Lists and Bid Forms. Copies may be obtained at the following W.A.A. Offices:

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- Territorial Regional Offices in Alaska, Puerto Rico and Hawaii
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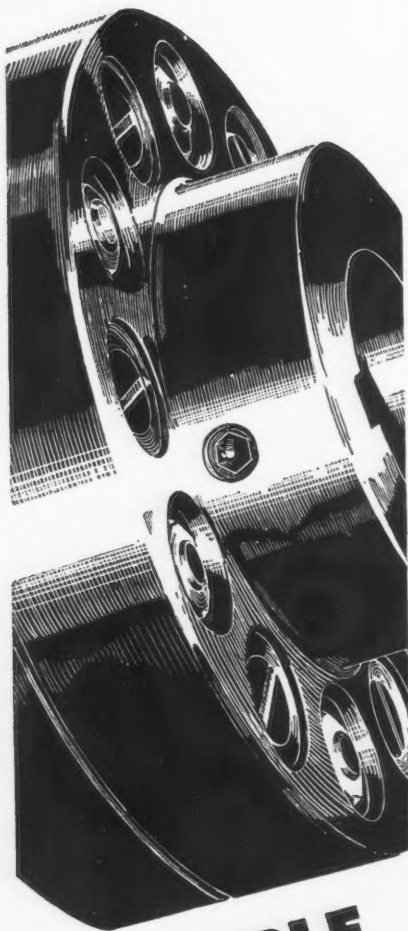
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NEWS OF INDUSTRY

coal to each industry for the summer period will be planned at a level equal to consumption during the summer of last year. This basis of allocation by restoring broadly the pattern of distribution last summer, when the inter-relation between industries was satisfactory, will help to iron out the dislocation which has resulted from the difficulties of recent months.

This new plan for industry does not in any way affect the stock-building program for power stations, gas works and other consumers. If Britain starts next winter with insufficient stocks it will be in for even greater difficulties than it experienced last winter. Industrial undertakings are ordered by the government to make it their responsibility to lay aside for the winter, out of their current deliveries, at least enough coal to meet three weeks' winter requirements by the end of October.

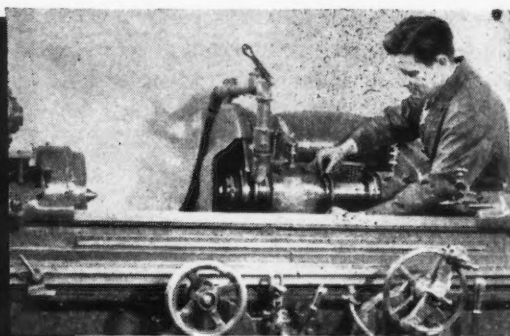
If firms fail to accumulate three weeks' stock, the winter allocations will nevertheless be based on the assumption that such a stock is, in fact, held and firms will be penalized to that extent. The govern-

ment is anxious to give industry every encouragement to economize in fuel consumption and to build up stocks; for this reason, whatever stocks are accumulated by firms over the summer months in excess of the three weeks' target will not be taken into account when the winter allocations are drawn up.

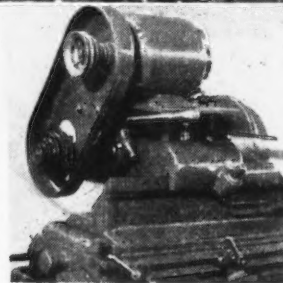
The government has instituted a special drive to increase and accelerate output of heavy electrical generating machinery by power stations. Along with mining equipment and others, it has been accorded the highest priority carrying with it action to insure iron and steel and other raw material supplies and the maximum assistance which the government can give in labor supply.

This drive is coordinated by the Heavy Electrical Plant Committee under the chairmanship of the Minister of Supply and consisting of representatives of all parties concerned. A special organization, based on wartime experience, has been set up in the Ministry of Supply to plan the work and assist manufacturers in overcoming bottlenecks.

Here's A Perfect Example of How Botwinik Rebuilding Goes Far Beyond Ordinary Reconditioning of Machines

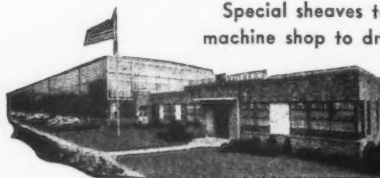


This Grinder underwent not only complete dismantling and precision rebuilding but redesign by Botwinik to meet the exact production requirements of the customer.



A Botwinik engineer checks the redesigned spindle, now equipped with new tapered extensions. Turned, reground and threaded between the front and rear bearings, this spindle holds an adjusting collar to take up both spindle and thrust, and furnishes a solid bearing.

Special sheaves to replace spur gears were manufactured in our machine shop to drive the work plate.



**Botwinik Brothers
of Mass., Inc.**
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Gebhart Named Head Of Machinery Group

Atlantic City, N. J.

• • • Walter H. Gebhart, first vice-president of Henry Disston & Sons, Inc., Philadelphia, was elected recently to the presidency of the American Supply & Machinery Manufacturers Assn. at the organization's 37th annual convention here. He succeeds Theodore F. Smith, president of Oliver Iron & Steel Co.,



Walter H. Gebhart

Pittsburgh.

Mr. Gebhart, who has been with the Disston firm continuously since his return to civilian life after World War I, has been active in the association for the last decade. During the last year he served as vice-president and headed the research and survey committee in developing a program for the future. For 5 years he was a member of the executive committee. In World War II he actively directed the work of the training within industry committee.

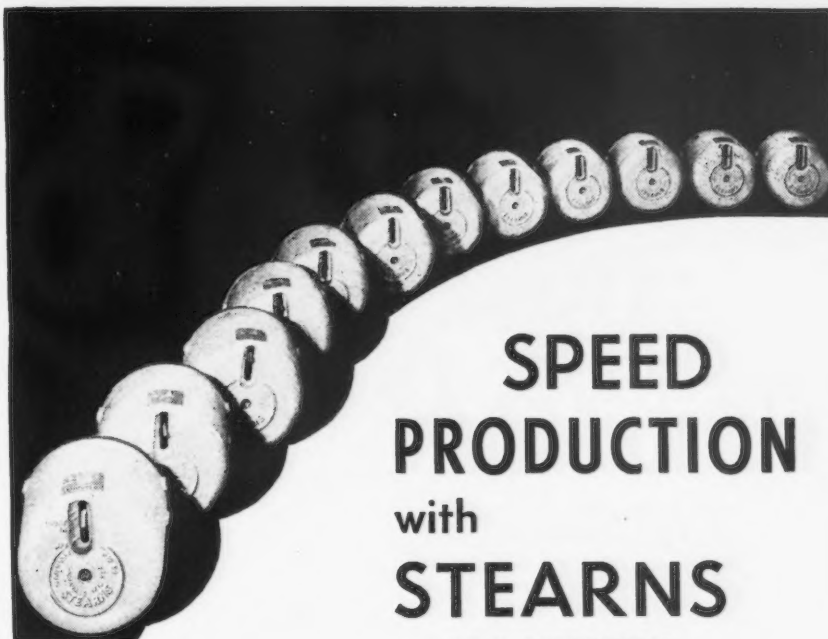
AFA Heads to Meet

Chicago

• • • The executive committee of the American Foundrymen's Assn. will meet June 4 at the Homestead Hotel, Hot Springs, Va., W. W. Maloney, secretary-treasurer, has announced.

AFA President Sheldon V. Wood, president-general manager, Minneapolis Electric Steel Castings Co., will preside.

Other members of the executive group are Max Kuniansky, vice-president and general manager of Lynchburg (Va.) Foundry Co., association vice-president and president-elect for 1947-48; J. H. Smith, general manager of the Central Foundry Div., General Motors Corp., Saginaw, Mich.; Joseph Sully, president, Sully Foundry Div., Neptune Meters, Ltd., Toronto; Fred J. Walls, Detroit office manager, International Nickel Co., and L. C. Wilson, Reading, Pa.



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Ask for Bulletin 604-E.



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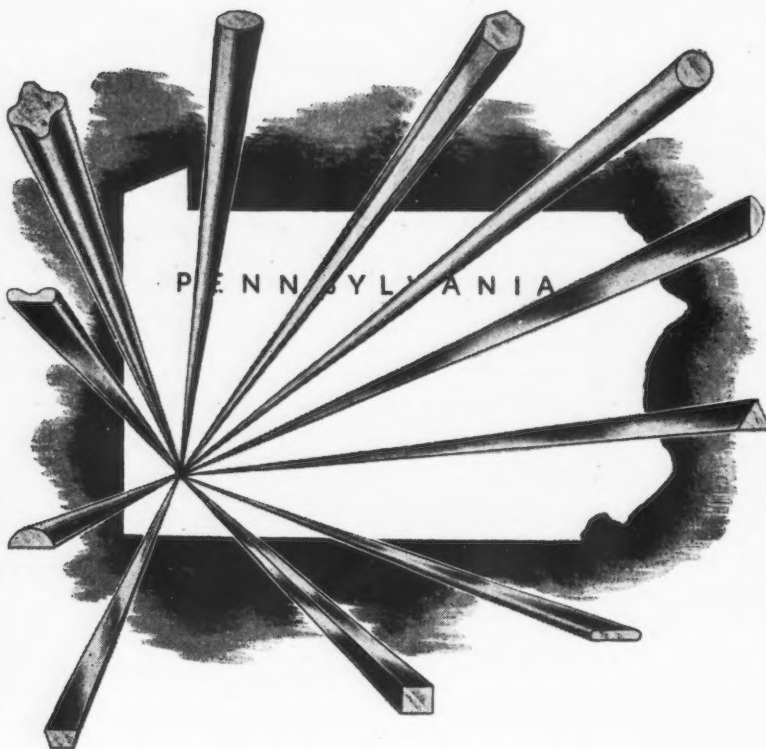
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NEWS OF INDUSTRY

Price of Pig Iron In Canada Up \$6.50 a Ton Retroactive to Apr. 15

Toronto

• • • Pig iron prices in Canada have been marked up \$6.50 per ton, but no action has been taken toward boosting steel prices. The new pig iron prices, which are retroactive to Apr. 15, are as follows: Base grade, 2.25 silicon and under, \$37.00; malleable, \$37.50; basic, \$37.00 delivered gross ton Toronto. As a result of the difference in freight rates, Montreal iron prices are quoted \$2.50 per ton above the Toronto base.

The greater part of the merchant pig iron delivered to melters in Ontario and Quebec is from the Algoma Steel Corp., Sault Ste. Marie, with only minor tonnages from Canadian Furnace Co., Port Colborne, while Steel Co. of Canada Ltd. and Dominion Steel & Coal Corp. are out of the market. The latter two companies require their entire output of pig iron in their own steelmaking operations.

There has been some easing in the pig iron supply situation recently, with output currently running above 70 pct of rated capacity, but demand continues to exceed supply, and most melters could use more iron if it was available. Blast furnace operators are accepting forward delivery contracts, but stipulate that price will be made known at time of shipment, thus forward buying does not protect consumers with regard to price increases, but gives them a more favored position in delivery.

There are no large stockpiles of iron in the hands of either producers or consumers. At present Canadian pig iron sales are holding around 10,000 tons weekly, with foundry iron accounting for approximately 5000 tons; malleable, 3500 tons, and basic iron, 1500 tons. Some melters have been held up recently due to lack of pig iron and have had to suspend melting operations for a few days.

While Canadian pig iron prices have been moved up \$6.50 per gross ton, they are still below the prices of United States iron delivered in Canada when duty, freight and exchanges are taken into consideration.

West Coast Steel Man Represents Industry On Pacific Scrap Survey

San Francisco

• • • L. G. Knight, manager of purchases and traffic, Seattle and Portland district, Bethlehem Pacific Coast Steel Corp., will represent the American steel industry in a survey tour of steel scrap accumulations in the Pacific Islands of Guam, Manus and Okinawa, and at Manila in the Philippines. The tour, sponsored by the U. S. Navy, was scheduled to begin on May 21.



L. G. Knight

Mr. Knight, prominent authority on steel scrap on the West Coast, has been associated for 35 years with steel scrap purchasing. He started at the Seattle Plant of Bethlehem Pacific in 1910 as an office boy and has been continuously in the steel industry since that time.

Making the swing as members of the committee, in addition to Mr. Knight, will be representatives of the steel scrap, foundry, and machine tool industries, the U. S. Navy, and other interested groups. Mr. Knight was named to the committee by the committee on iron and steel scrap of the American Iron & Steel Institute.

It is known, for instance, that in the harbor of Manila, numerous major type vessels lie sunken and must be raised and removed to clear the waters of obstacles to shipping. Thousands of tons of steel scrap suitable for steel making are recoverable from these wrecks, and from damaged and abandoned vehicles, etc.

A former Administrative Officer of an Ordnance Depot in the Philippines told THE IRON AGE that there was undoubtedly a vast quantity of scrap iron and steel reposing in the islands. There were, he said, about 14,000 unusable vehicles on one airstrip only a year ago. But he asserted that the inroads of the jungle and the lack of suitable manpower and equipment would make the cost of cutting them up and shipping the scrap almost prohibitive.

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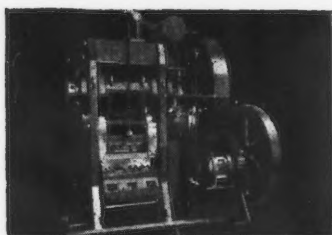
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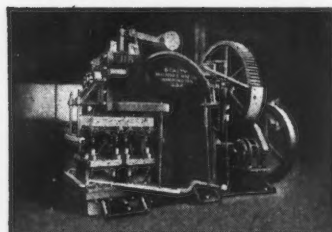
DETREX

DETROIT 32, MICHIGAN

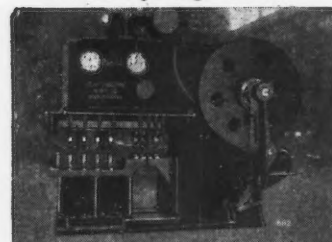
Corporation



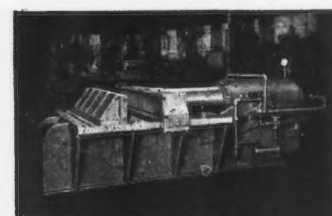
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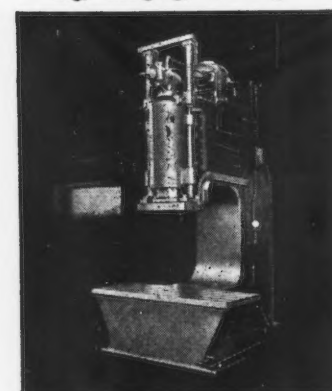
BEATTY No. 11-B heavy duty punch for production tooling and use with BEATTY Spacing Table.



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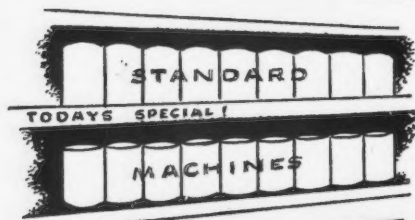
BEATTY 250-ton gap type press for forming, bending, flanging, pressing.



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NEWS OF INDUSTRY

New Yorkers to Get More Speed, Comfort In New Subway Cars

Pittsburgh

• • • Westinghouse Electric Corp., Pittsburgh, is building equipment for 200 new cars that will provide subway passengers on New York's Transit System with smoother, quieter rides and make possible faster operating schedules. The new cars are expected to be in operation in 1948. Each car will be driven by four 100 hp motors, one on each axle. The faster acceleration thus may allow stepped-up operating schedules especially for local trains where stops are more frequent than in express service. Most present cars are powered by two 200 hp motors.

Virtually all new cars now in use have motors and gears mounted directly on the axles. This added solid weight increases jar at every rail juncture. The new cars' motors are to be spring suspended. The gears also are to be connected to the motors through flexible couplings and will operate on roller bearings instead of the older type sleeve bearings, thus saving wear and allowing them to be kept in more perfect mesh, a factor that eliminates noise. In such systems smaller gear teeth can be used, reducing noise still further.

Tracks will remain level longer under operation of the new cars because they receive no heavy blows such as are caused by the solidly connected motor and gears attached to an axle.

The outstanding feature in the new cars' electrical systems is the adaptation of electric dynamic braking, which, under normal loads and conditions, may handle as much as 80 pct of all braking operations.

From the top speed of 55 mph down to 10 mph, braking will be done electrically. This reduces drastically the wear on brake shoes. When a car is slowed to 10 mph, the electric dynamic braking decreases and from 10 to 5 mph, the electric system and air brakes both are working together. The final stop is handled by the air brakes alone.

This results in smoother stops and will allow an increase of 50 pct in the braking rate. Whereas the present cars equipped with

air brakes can decelerate from 30 mph to a stop in 15 sec., the new cars can do it in 10 sec. Because braking is smooth, passengers will not experience discomfort at the higher rate.

Studies have shown that many pounds of metallic dust are ground from the brake shoes of subway cars each day and distributed through the tunnels. Elimination of much of this dust will aid in keeping the subway air cleaner.

There are 18 steps each for accelerating and decelerating the new cars as opposed to nine used for acceleration only, on present cars. This provides smooth operation in which passengers cannot feel individual steps of acceleration or braking.

Each of the completed cars will be 60½ ft long and will cost the New York Board of Transportation \$66,000 apiece. Motors, gears and control equipment to be furnished by Westinghouse for the 200 cars will cost \$3,381,000.

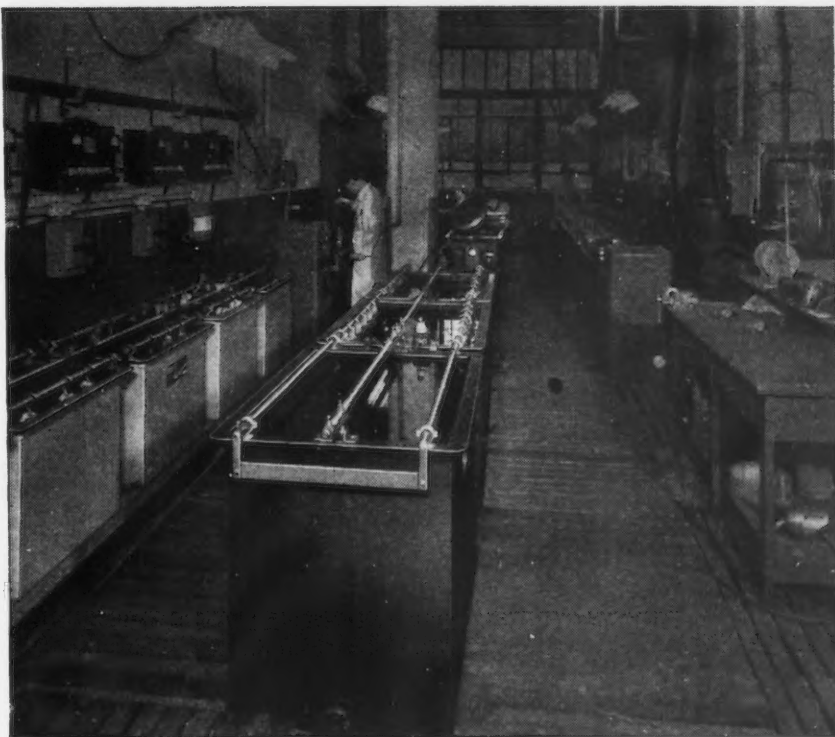
Asks Census Amendment

Chicago

• • • Amendment of the basic census law to permit disclosure of the names of firms and individuals in the manufacturing, mining and business fields as to products or service has been recommended by the Chicago Assn. of Commerce and Industry. The association urged that a census be conducted next year and repeated at 5-year intervals, with the Bureau of Census authorized to make continuing studies in intervening years to determine trends in manufacturing, mining and business field. Prior to the war this census was taken every 2 years.

The interim studies, the association said, would keep businessmen currently informed instead of having to rely on data that might be 2 years old before it is printed and distributed. The present census law prohibits the disclosure of data on the amount of production or business done by an individual or firm, and has been interpreted as forbidding the disclosure of the type of production or business. The amendment recommended would permit the publication of more comprehensive and accurate directories than are now available.

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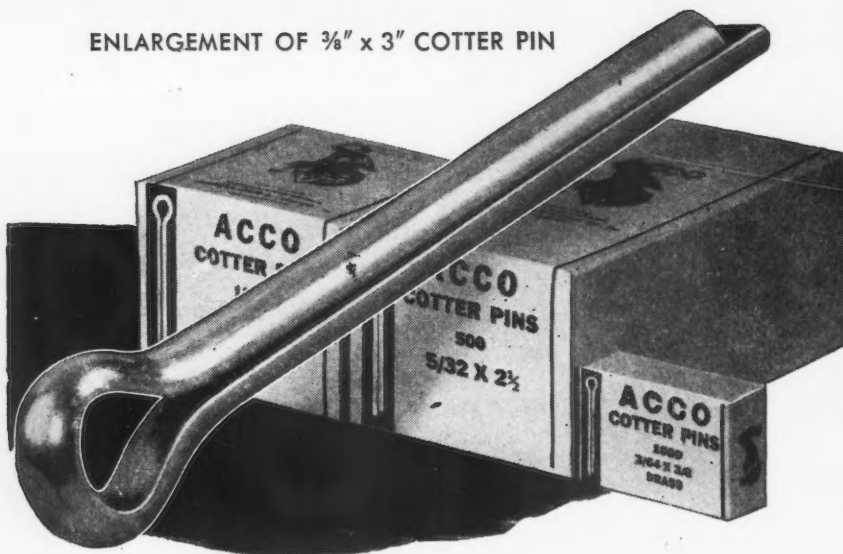
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YORK, PA.—American Chain makes two types of cotter pins in a full range of sizes. In addition to the ACCO (regular type, shown above) American offers the CAMPBELL HAMMERLOCK, which locks positively and permanently by simply striking the head with a hammer—a distinct advantage on a production line.

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AMERICAN CHAIN & CABLE**

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NEWS OF INDUSTRY

The London Economist

(CONTINUED FROM PAGE 113)

portion of their face value after each month in the same ownership. (Not unnaturally such plans were never put into operation.) It was almost by accident that the cigarette was found to have this useful quality. How often did not the cry go up, in 1945, that what Europe needs is an indestructible cigarette—a reverse, and perhaps a perverse, tribute to the practical utility of the cigarette as currency. The whole secret of the cigarette was that it could in fact be smoked.

It had, of course, other advantages. It was reasonably small in size and conveniently packed. It was generally available in such supply that the single unit had a value not too different from that of the standard national metal currency. It did not perish if properly stored. It was light in weight. It could not easily be forged or counterfeited and by the happy chance of history its dimensions were very largely internationally standardized. In short, the practical genius of mankind as a trading being saw it as a heaven sent currency medium and used it accordingly.

Undoubtedly one of the most interesting sections in any history of the cigarette will be that examining the amazing inability of the authorities to appreciate what was happening before their very eyes.

To future generations it will be inconceivable that no government made even the most tentative plan to fit this new currency into its proper place in the economic life. It was not as though they had ignored its existence. In many countries its manufacture had been made into a profitable state monopoly. In others, Britain, for example, it had been utilized as a valuable instrument of taxation. Yet not one government made any attempt to regularize its use as currency.

On the contrary, many went out of their way to free it from all control whatsoever. Some governments did limit the number of fresh cigarettes that any one individual could acquire each month. Others went to the other extreme and made it easy for an individual to buy as many as he wished and as cheaply as possible. (There is a



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school of thought that considers this policy in fact to have been deliberately designed to assist the citizens of that country, and so the country itself, to establish general economic control, or at least to acquire considerable economic benefits, in occupied Europe, but no evidence has, as yet, been adduced to support this theory.)

Yet a good deal could have been done to turn this new development to desirable economic ends. It would have been perfectly possible to convert cigarettes into the only currency available to the occupying armies and to prohibit their sale fresh throughout the whole of the territories of the defeated powers.

By this means the supply of currency could have been regulated in the areas where regulation was a crying need. Fresh cigarettes returned into stock could have been withdrawn from circulation (the person returning them drawing an equivalent credit on national currency in his country of origin) and the market in commodities as a result kept under some control. Further, since some cigarettes would have inevitably been smoked, the demand for fresh stocks would have left the manufacturers no real cause for complaint.

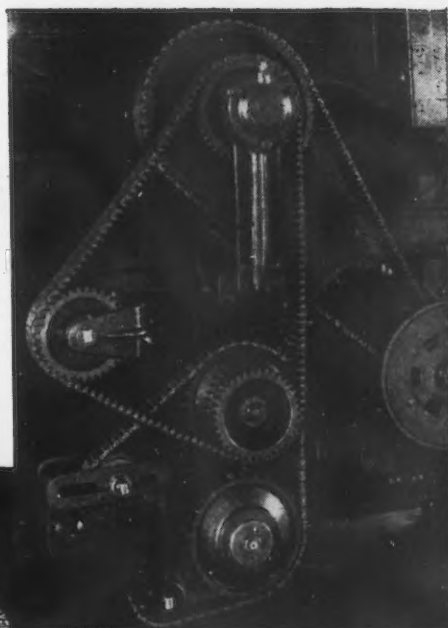
However, nothing of the kind was done. Ignorance, lack of imagination or the obstinate regard for outworn traditions (as, for example, the tradition, strong, if comparatively recent, that soldiers must always be paid in cash) involved the states supplying the cigarettes in very considerable losses. Only our future historian will be able to tell how quickly, if at all, these lessons were learned, or what effective steps were ultimately taken to counteract the dangers of such an unregulated currency.

But, however much it may distress our vanity today, there is one comment that the future generations of economists and sociologists will inevitably make. It is in the change of concepts illustrated by the discard of gold as an international medium and by the adoption of tobacco in its place.

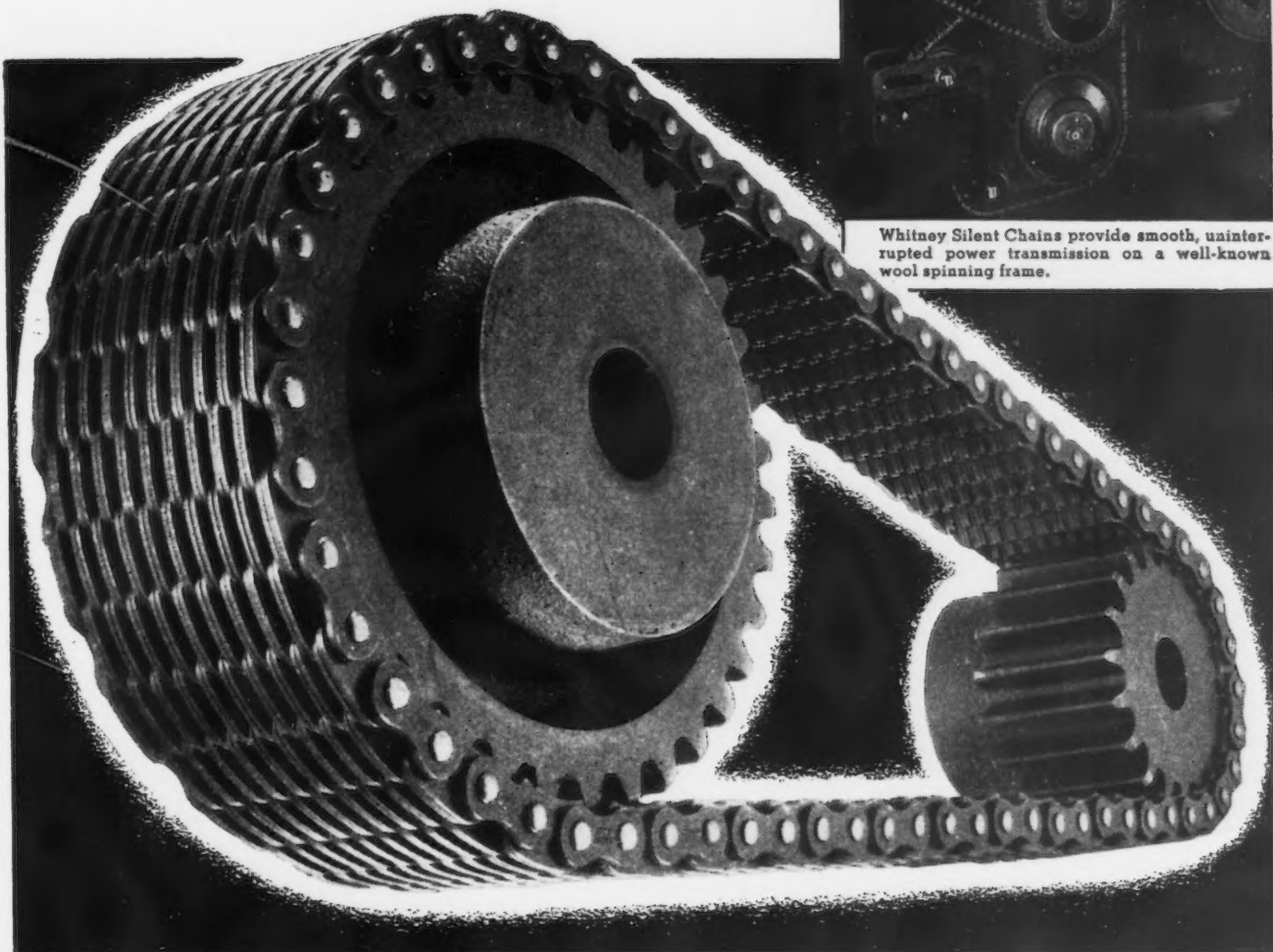
Gold, after all, had its heroic qualities. In more primitive days, the man who possessed it did not hide it all away. He used it. It graced his woman, it decorated his table and his home. By wearing it himself he added dignity to his carriage and, given as an act of char-

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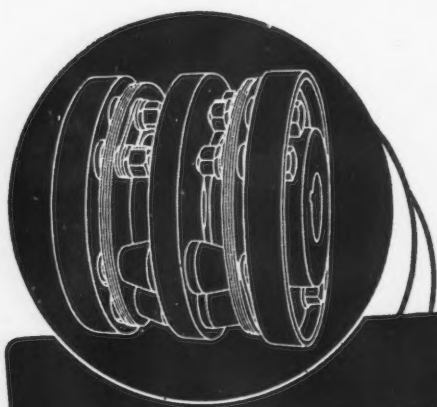
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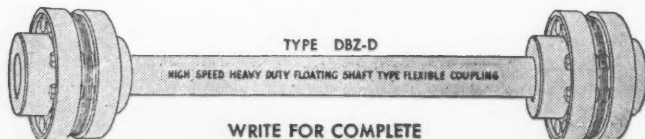
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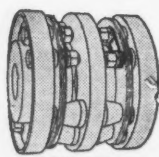
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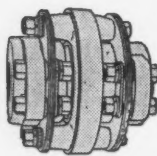
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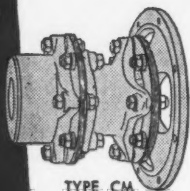
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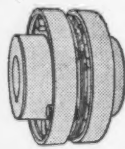
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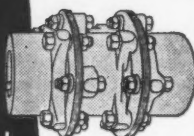
TYPE DSM



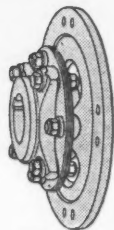
TYPE CM



TYPE ST



TYPE AM



TYPE SS

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

NEWS OF INDUSTRY

ity or piety, it brought beauty and light into his places of worship. A fortune was not represented by pieces of paper lacking even artistic merit. It shone for all to see.

What can one say of the cigarette? It is the symbol of idleness and forgetfulness. Where gold stimulates, a cigarette soothes. Where silver gives back to the sun some of its splendor, tobacco sets up a cloud between mankind and the sky.

The contrast is all too pointed. The Elizabethans set out to find the treasures of the New World. The one discovery of theirs to last longest is a weed. If our future historian wishes to moralize, as well he may, what a theme awaits his pen.

Weekly Gallup Polls

(CONTINUED FROM PAGE 109)

In December when the no opinion vote was eliminated, the division among those with opinions was 90 pct saying the GOP would win in 1948, 10 pct saying the Democrats would win.

Today, on the same basis, 64 pct say the Republicans will win, 36 the Democrats.

Here is a table showing the way Democrats and Republicans with opinions vote on the question today as contrasted with December:

	Democrats	
	Dec. '46 Pct	Today Pct
Think Democrats will win...	24	60
Think GOP will win	76	40

Eighteen percent of the Democrats are undecided today.

	Republicans	
	Dec. '46 Pct	Today Pct
Think Democrats will win...	1	14
Think GOP will win	99	86

Twelve percent among the Republican voters said they were undecided on the question today.

• • • A substantial segment of the total voting population can't say right now which political party has the most members in either branch of Congress.

This finding emerges from a nationwide poll in which institute field reporters asked:

(1) "Do you happen to know which party—The Democratic or Republican—has the

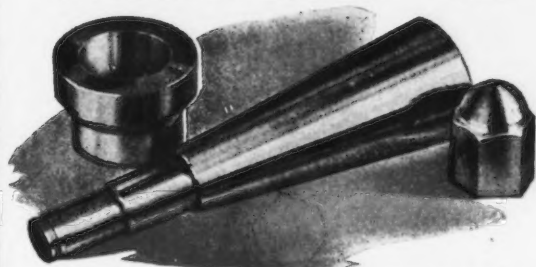
JOB SHOP STANDARDIZES ON...



GREENLEE MULTIPLE-SPINDLE AUTOMATICS

SMALL LOTS HANDLED PROFITABLY BY SCREW MACHINE PRODUCTS CO.

Here is more evidence indicating the unusual adaptability of Greenlee Automatics for handling short run screw machine jobs. At Screw Machine Products Co., Milwaukee, 50% of the work produced in 1946 by this battery of 4- and 6-spindle Greenlees consisted of runs between 1,000 and 10,000 pieces. Stock sizes ranged from $\frac{1}{4}$ " to $2\frac{5}{8}$ " in diameter. Quick change-overs in set-ups and economical tooling were a "must" in meeting competitive market conditions. The experience of this company with the savings made by Greenlee Automatics dates back to 1939 when a 1" 6-spindle machine was installed. Today, the 16 Greenlees in a standardized set-up handle a thriving job shop business.



TYPICAL PARTS PRODUCED

- (A) Stainless Steel Pipe Fitting from $1\frac{1}{2}$ " round, type 430 S. S. stock. Time: 31 sec. per piece.
(B) Tapered Steel Roller from $1\frac{1}{8}$ " round, SAE 4620 stock. Time: 55 sec. per piece.
(C) Hex nut $\frac{3}{4}$ " from B1113 stock. Time: $8\frac{1}{2}$ sec. per piece (Dual set-up).



GREENLEE BROS. & CO.
1805 MASON AVE.
ROCKFORD, ILLINOIS



WRITE FOR MORE FACTS — SEE MOVIE

Send for a copy of 20-page book explaining timesaving and cost-saving features of Greenlee Automatics. Ask to see new 40-minute sound movie showing the building of a Greenlee "6" from foundry to finished machine.

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

Typical of
Hendrick's
Manufacturing
Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing riveting, etc. The perforated

elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities.

Write us in detail regarding any metal product you desire fabricated.



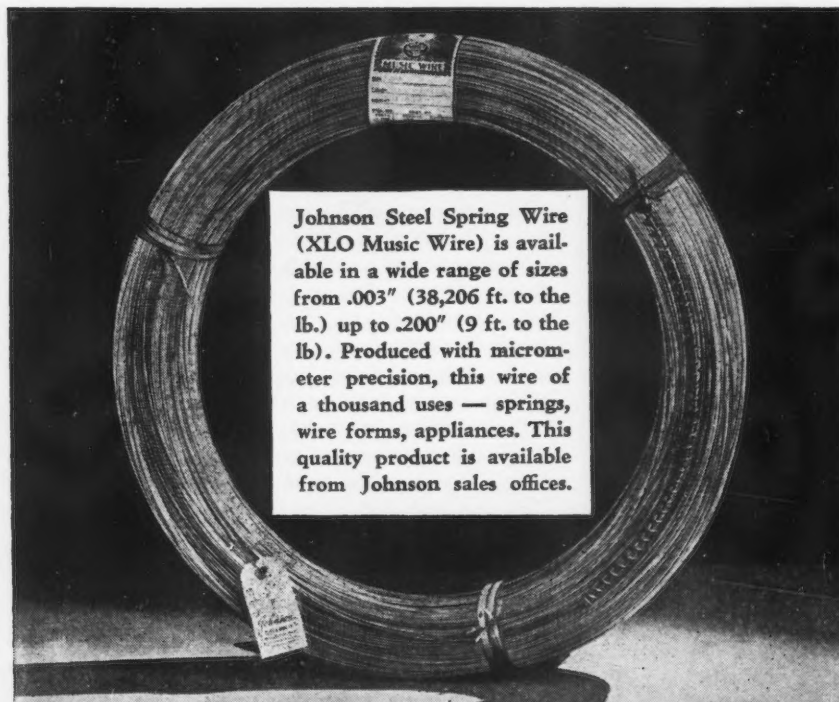
Perforated Metals
Perforated Metal Screens
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"Shur-Site" Treads and
Armorgrids

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Manufacturing Company

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Sales Offices In Principal Cities



Johnson Steel Spring Wire (XLO Music Wire) is available in a wide range of sizes from .003" (38,206 ft. to the lb.) up to .200" (9 ft. to the lb.). Produced with micrometer precision, this wire of a thousand uses — springs, wire forms, appliances. This quality product is available from Johnson sales offices.

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STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.

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NEWS OF INDUSTRY

most members in the U. S. House of Representatives?"

The results:

	Pct
Democrats do	10
Republicans do	64
Don't know	26
(2) "And do you happen to know which political party has the most members in the Senate?"	

The results:

	Pct
Democrats do	9
Republicans do	58
Don't know	33

One thing should be kept in mind, however, in considering the above tables: They represent proportions of the total eligible voting populations, not of the number of persons who actually cast votes. There is always a substantial group who do not go to the polls. In 1940, for example, the proportion of eligible voters who did not actually vote amounted to 37 pct.

Better than eight out of ten among college people know the answer on both questions. More than half among those with grammar school education or less can't say who controls the Senate.

These facts are shown below:

Who Controls House?

	Democrats Control Pct	Republicans Control Pct	Don't Know Pct
Men	9	71	20
Women	11	57	32
College	6	88	6
High School	9	72	19
Grammar or Less	11	53	36
21-29 Years	11	66	23
30-49 Years	10	64	26
50 & Over	9	63	28

Who Controls Senate?

	Democrats Control Pct	Republicans Control Pct	Don't Know Pct
Men	8	66	26
Women	10	50	40
College	9	82	9
High School	9	64	27
Grammar or Less	9	48	43
21-29 Years	9	60	31
30-49 Years	10	57	33
50 & Over	8	58	34

Sells Casting Facilities

Washington

••• Surplus steel casting facilities at Birdsboro, Pa., have been sold by WAA for \$450,000 to the wartime operator, Birdsboro Steel Foundry & Machine Co. Machine tools, machinery and miscellaneous equipment items were included in the sale.